STEVEN L. BESHEAR
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

LEONARD K. PETERS
SECRETARY

FACT SHEET

KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM
PERMIT TO DISCHARGE TREATED WASTEWATER
INTO WATERS OF THE COMMONWEALTH

PERMIT No.: KY0003484 **Permit Writer:** Sara J. Beard **Date:** June 17, 2009
AI No.: 2966

1. SYNOPSIS OF APPLICATION

a. Name and Address of Applicant

Westlake Vinyls, Inc.
P.O. Box 712
Calvert City, Kentucky 42029

b. Facility Location

Westlake Vinyls, Inc.
2672 Industrial Parkway
Calvert City, Marshall County, Kentucky

c. Description of Applicant's Operation

Westlake CA&O, a division of Westlake Vinyls, Inc., converts salt to caustic and chlorine in the chlor-alkali plant. Propane is converted to ethylene in the ethylene plant. Westlake Monomers, a division of Westlake Vinyls, Inc., uses chlorine and ethylene as feedstock for the EDC/VCM complex. Westlake's primary product is vinyl chloride. Lubrizol and Cymetech own and operate a specialty polymers plant and dicyclopentadiene plant at the site (SIC Codes 2869, 2812, and 2821)

d. Production Capacity of Facility

Membrane Cell Chlorine Production – 1,672,000 lbs/day

Mercury Cell Chlorine Production – Westlake Vinyls, Inc. no longer uses Mercury Cells for chlorine production.

1. SYNOPSIS OF APPLICATION

e. Description of Existing Pollution Abatement Facilities

Outfall 001 - Contributing flows to Outfall 001 include cooling tower blowdown (0.5195 MGD), boilerhouse water (0.068 MGD), sand filter backwash (0.347 MGD), sanitary facilities and barge eyewash stations (0.03275 MGD), miscellaneous uses of water (office air conditioner cooling water, boiler blowdown, incinerator blowdown, scrubber discharge, hoses, etc. – 0.2488 MGD), Chlor-Alkali utility building discharge (compressor cooling water and deionizer blowdown – 0.0679 MGD), storm water runoff (0.0732 MGD), Outfall 002 wastewater (0.9948 MGD), Outfall 003 wastewater (0.3658 MGD), and Outfall 009 wastewater (1.512 MGD). All process wastewater and sanitary wastewater streams are treated and then combined with all other wastestreams prior to discharge to the Tennessee River at a rate of 4.2042 MGD.

Wastewater from the Chlor-Alkali plant is treated by sulfide precipitation and carbon adsorption to remove mercury prior to leaving the plant. Ethylene plant wastewater flows through an oil removal system before going to secondary treatment. EDC/VCM and Carbopol wastes are steam stripped prior to entering secondary treatment. There, organic process waters are combined for biological treatment and solids removal before leaving the plant through Outfall 001.

Outfall 002 - Contributing flows to Outfall 002 include sanitary wastewater (0.58525 MGD), specialty polymers (Carbopol) wastewater (0.051 MGD), EDC/VCM process wastewater (0.4997 MGD), storm water runoff (0.0462 MGD), ethylene plant process wastewater (0.2714 MGD), and Cymetech stormwater, boiler feed water and cooling tower blowdown (0.0043 MGD – included above). The total flow to Outfall 001 is 1.4508 MGD.

Outfall 003 - The contributing flow to Outfall 003 includes Membrane Cell Chlor-Alkali Plant wastewater (0.3658 MGD). This wastestream is monitored prior to comingling with Outfalls 002 and 009 effluents and then discharged via Outfall 001 to the Tennessee River.

Outfall 004 - Storm water runoff from the northeast corner of the plant property (60.26 acres) is discharged to the Tennessee River without treatment. This outfall is being removed from the permit.

Outfall 005 - Storm water runoff from the southeast section of the plant property (2.75 acres) is discharged to an unnamed tributary to the Tennessee River without treatment. This outfall is being removed from the permit.

1. SYNOPSIS OF APPLICATION

e. Description of Existing Pollution Abatement Facilities - continued

Outfall 006 - Storm water runoff from the south central section of the plant property (8.50 acres) is discharged to an unnamed tributary to the Tennessee River without treatment. This outfall is being removed from the permit.

Outfall 007 - Storm water runoff from the south central section of the plant property (14.23 acres) is discharged to an unnamed tributary to the Tennessee River without treatment. This outfall is being removed from the permit.

Outfall 008 - Storm water runoff from the southwest section of the plant property (6.46 acres) is discharged to an unnamed tributary to the Tennessee River without treatment. This outfall is being removed from the permit.

Outfall 009 - The contributing flow to Outfall 009 includes aquifer water and leachate (1.512 MGD). This wastestream is treated prior to comingling with Outfalls 002 and 003 effluents and then discharged via Outfall 001 to the Tennessee River.

f. Permitting Action

Renewal of a major KPDES permit for an existing source vinyl chloride production facility.

2. RECEIVING WATERS

a. Receiving Water Name

Outfall 001 discharge to the Tennessee River at the following coordinates: N 37° 03′ 19″, W 88° 19′ 51″. Outfalls 002, 003, and 009 are internal outfalls to 001.

b. Stream Segment Use Classifications

The Tennessee River is classified as a Warmwater Aquatic Habitat, Primary Contact Recreation, Secondary Contact Recreation, and Outstanding State Resource Water.

c. Stream Segment Antidegradation Categorization

The Tennessee River is categorized as a High Quality Water.

d. Stream Low Flow Condition

At the point of discharge the 7Q10 and the Harmonic Mean for the Tennessee River are 5,000 cfs and 40,283 cfs, respectively.

3. REPORTED DISCHARGE AND PROPOSED LIMITS

Description of Discharge - Outfall 001 – Contributing flows to Outfall 001 include cooling tower blowdown (0.5195 MGD), boilerhouse water (0.068 MGD), sand filter backwash (0.347 MGD), sanitary facilities and barge eyewash stations (0.03275 MGD), miscellaneous uses of water (office air conditioner cooling water, boiler blowdown, incinerator blowdown, scrubber discharge, hoses, etc. – 0.2488 MGD), Chlor-Alkali utility building discharge (compressor cooling water and deionizer blowdown – 0.0679 MGD), storm water runoff (0.0732 MGD), Outfall 002 wastewater (0.9948 MGD), Outfall 003 wastewater (0.3658 MGD), and Outfall 009 wastewater (1.512 MGD). All process wastewater and sanitary wastewater streams are treated and then combined with all other wastestreams prior to discharge to the Tennessee River at a rate of 4.2042 MGD.

Effluent Characteristics	Reported Discharge Monthly Average	Reported Discharge Daily Maximum	Proposed Limits Monthly Average	Proposed Limits Daily Maximum	Applicable Water Quality Criteria and/or Effluent Guidelines
Flow (MGD)	2.52	2.77	Report	Report	401 KAR 5:065, Section 2(8)
Temperature (^{o}F)	77.8	83.6	95.0	100.0	401 KAR 10:031, Section 4(1) 401 KAR 10:029, Section 4 401 KAR 5:080, Section 1(2)(c)
Oil & Grease (mg/l)	1.39	4.08	10	15	401 KAR 5:080, Section 1(2)(c)2
Hardness (as mg/l $CaCO_3$)	150	192	Report	Report	401 KAR 5:065, Section 2(8)
Chloride (mg/l)	1,609	2,087	3,000	6,000	401 KAR 10:031, Section 4 401 KAR 10:029, Section 4 401 KAR 5:080, Section 1(2)(c)
pH (Standard Units)	6.14 (min)	8.56 (max)	6.0 (min)	9.0 (max)	401 KAR 10:031, Section 4
Total Residual Chlorine (mg/l)	0.014	0.030	0.19	0.19	401 KAR 10:031, Section 4 401 KAR 10:029, Section 4(4)
Acute Toxicity (TU_a)	N/A	3.43	Report	4.05	401 KAR 10:031, Section 4 401 KAR 10:029

3. REPORTED DISCHARGE AND PROPOSED LIMITS - continued

Total Recoverable Mercury (mg/l)	0.001	0.003			
Tier 1			0.017	0.017	401 KAR 10:031, Section 4 401 KAR 10:029, Section 4(4)
Tier 2			0.017	0.017	401 KAR 10:031, Section 4 401 KAR 10:029, Section 4(4)
Tier 3			0.00051	0.0017	401 KAR 10:031, Section 4 401 KAR 10:029, Section 4(10)
1,2-Dichloroethane (mg/l)	0.087	0.263	Report	Report	401 KAR 5:065, Section 2(8)
Benzene (mg/l)	0.027	0.049	Removing from Permit		401 KAR 5:080, Section 1(2)(c)2
Chloroform (mg/l)	0.023	0.023	Removing from Permit		401 KAR 5:080, Section 1(2)(c)2
Ethylbenzene (mg/l)	0.0075	0.0075	Report	Report	401 KAR 5:065, Section 2(8)
Tetrachloroethylene (mg/l)	BDL	BDL	Report	Report	401 KAR 5:065, Section 2(8)
Toluene (mg/l)	0.020	0.020	Removing from Permit		401 KAR 5:080, Section 1(2)(c)2
1,1,2-Trichloroethane (mg/l)	0.027	0.027	Report	Report	401 KAR 5:065, Section 2(8)
Vinyl Chloride (mg/l)	0.0042	0.0042	Report	Report	401 KAR 5:065, Section 2(8)
Anthracene (mg/l)	<0.01	<0.01	Report	Report	401 KAR 5:065, Section 2(8)
Fluorene (mg/l)	0.008	0.008	Removing from Permit		401 KAR 5:080, Section 1(2)(c)2
Hexachlorobenzene (mg/l)	0.0014	0.0014			
Tier 1			0.0015	0.0015	401 KAR 5:080, Section 1(2)(c)2
Tier 2			0.000128	Report	401 KAR 10:031, Section 4 401 KAR 10:029, Section 4(4)
Tier 3			$2.9x10^{-7}$	Report	401 KAR 10:031, Section 4 401 KAR 10:029, Section 4(10)

3. REPORTED DISCHARGE AND PROPOSED LIMITS - continued

Effluent Characteristics	Reported Discharge Monthly Average	Reported Discharge Daily Maximum	Proposed Limits Monthly Average	Proposed Limits Daily Maximum	Applicable Water Quality Criteria and/or Effluent Guidelines
Phenanthrene (mg/l)	0.011	0.011	Report	Report	401 KAR 5:065, Section 2(8)
Pyrene (mg/l)	0.006	0.006	Report	Report	401 KAR 5:065, Section 2(8)
Chromium (Hexavalent) (mg/l)	BDL	BDL	Removing from Permit		401 KAR 5:080, Section 1(2)(c)2
Total Recoverable Copper (mg/l)	0.035	0.035	0.15	0.15	401 KAR 10:031, Section 4 401 KAR 10:029, Section 4(4)
Total Recoverable Zinc (mg/l)	0.026	0.026	Removing from Permit		401 KAR 5:080, Section 1(2)(c)2

The data contained under the reported discharge columns are from the analysis of the DMR data that has been reported during the term of the current permit.

The abbreviation N/A means Not Applicable.

The abbreviation N/R means Not Reported.

The abbreviation BDL means Below Detection Limit.

Tier 1 – Tier 1 limits apply during the period of time between the permit effective date and three years from that date.

Tier 2 – Tier 2 limits apply during the period of time between the end of Tier 1 (three years from the effective date of the permit) and September 8, 2014.

Tier 3 – Tier 3 limits apply after September 8, 2014.

4. METHODOLOGY USED IN DETERMINING LIMITATIONS

a. Serial Number

Outfall 001 – Contributing flows to Outfall 001 include cooling tower blowdown, boilerhouse water, sand filter backwash, sanitary facilities and barge eyewash stations, miscellaneous uses of water (office air conditioner cooling water, boiler blowdown, incinerator blowdown, scrubber discharge, hoses, etc.), Chlor-Alkali utility building discharge (compressor cooling water and deionizer blowdown), storm water runoff, Outfall 002 wastewater, Outfall 003 wastewater, and Outfall 009 wastewater. All process wastewater and sanitary wastewater streams are treated and then combined with all other wastestreams prior to discharge.

b. Effluent Characteristics

Flow	Temperature
Oil & Grease	Hardness
Chloride	pH
Total Residual Chlorine	Acute Toxicity
Total Recoverable Mercury	1,2-Dichloroethane
Benzene	Chloroform
Ethylbenzene	Tetrachloroethylene
Toluene	1,1,2-Trichloroethane
Vinyl Chloride	Anthracene
Fluorene	Hexachlorobenzene
Phenanthrene	Pyrene
Chromium (Hexavalent)	Total Recoverable Copper
Total Recoverable Zinc	

c. Pertinent Factors

Westlake Vinyls, Inc. requested a mixing zone for all effluent parameters at this outfall. After review of the multi-port diffuser information submitted by the permittee and DMR data, the Division of Water has determined that mixing zones will be granted for Temperature, Chloride, Total Residual Chlorine, 1,2-Dichloroethane, 1,1,2-Trichlorethane, Total Recoverable Copper, Total Recoverable Mercury, and Hexachlorobenzene only. Two different mixing zones are being assigned to this discharge: one for Temperature only and a second for Chloride, Total Residual Chlorine, 1,2-Dichloroethane, 1,1,2-Trichlorethane, Total Recoverable Copper, Total Recoverable Mercury, and Hexachlorobenzene. The physical description of both mixing zones can be found in section 15 of this Fact Sheet. Total Recoverable Mercury and Hexachlorobenzene are listed as bioacumulative chemicals of concern in 401 KAR 10:029, Section 4(10). Mixing zones are being granted for these parameters because in the past one has been granted. Pursuant to 401 KAR 10:029, Section 4(10) the mixing zone for these parameters will expire after September 8, 2014.

A summarization of the thermal mixing zone model, chloride mixing zone model, and water quality standards can be found in Fact Sheet Attachment A – CORMIX Diffuser Model - Thermal, Fact Sheet Attachment B – CORMIX Diffuser Model – Chloride, and Fact Sheet Attachment C - Steady State Toxics Wasteload Allocation Model (SSTWAM2004), respectively.

d. Monitoring Requirements

The flow shall be monitored continuously by a recorder.

4. METHODOLOGY USED IN DETERMINING LIMITATIONS - continued

d. Monitoring Requirements - continued

Hardness, Temperature, Chloride, Oil & Grease, Total Residual Chlorine, pH, and Total Recoverable Mercury shall be monitored once per week by grab sample.

Ethylbenzene, Tetrachloroethylene, 1,2-Dichloroethane, 1,1,2-Trichloroethane, Vinyl Chloride, Anthracene, Hexachlorobenzene, Phenanthrene, Pyrene, and Total Residual Copper shall be monitored once per month by grab sample.

Acute Toxicity shall be monitored once per quarter by 2 grab samples as described in Part IV of the permit.

e. Justification of Limits

The Kentucky Administrative Regulations (KARs) cited below have been duly promulgated pursuant to the requirements of Chapter 224 of the Kentucky Revised Statutes (KRSs).

Flow, Hardness, 1,2-Dichloroethane, Ethylbenzene, Tetrachloroethylene, 1,1,2-Trichloroethane, Vinyl Chloride, Anthracene, Phenanthrene, and Pyrene
The monitoring requirements for these parameters are consistent with requirements of 401 KAR 5:065, Section 2(8).

pH
The limits for these parameters are consistent with the requirements of 401 KAR 10:031, Section 4.

Total Residual Chlorine and Total Recoverable Copper
The limits for these parameters are consistent with the requirements of 401 KAR 10:031, Section 4 and 401 KAR 10:029, Section 4(4).

Total Recoverable Mercury
Tier 1 and 2 limits for this parameter are consistent with the requirements of 401 KAR 10:031, Section 4 and 401 KAR 10:029, Section 4(4).

Tier 3 limits for this parameter are consistent with the requirements of 401 KAR 10:031, Section 4 and 401 KAR 10:029, Section 4(10).

Hexachlorobenzene
Tier 1 limits for this parameter are consistent with the requirements of 401 KAR 5:080, Section 1(2)(c)2. It is the "Best Professional Judgment" (BPJ) of the Division of Water that the permittee be allowed to keep the limits for this parameter from the previous permit for a period of three years in order to allow time to come into compliance with the more restrictive Tier 2 limits.

Tier 2 limits for this parameter are consistent with the requirements of 401 KAR 10:031, Section 4 and 401 KAR 10:029, Section 4(4).

Tier 3 limits for this parameter are consistent with the requirements of 401 KAR 10:031, Section 4 and 401 KAR 10:029, Section 4(10).

4. METHODOLOGY USED IN DETERMINING LIMITATIONS - continued

e. Justification of Limits - continued

Temperature and Chloride
The limits for these parameters are consistent with the requirements of 401 KAR 10:031, Section 4, 401 KAR 10:029, Section 4, and 401 KAR 5:080, Section 1(2)(c)2.

Oil & Grease
The limits for this parameter are consistent with the requirements of 401 KAR 5:080, Section 1(2)(c)2.

Acute Toxicity
The requirements for this parameter are consistent with the requirements of 401 KAR 10:031, Section 4 and 401 KAR 10:029.

Benzene, Chloroform, Toluene, Fluorene, Hexavalent Chromium, and Total Recoverable Zinc
The removal of these parameters is consistent with the requirements of 401 KAR 5:080, Section 1(2)(c)2. A review of the DMR data for the previous permit indicated that reasonable potential did not exist for these parameters to be limited or monitored in the permit. Therefore, it is the "Best Professional Judgment" (BPJ) of the Division of Water that these parameters be removed from the permit.

5. REPORTED DISCHARGE AND PROPOSED LIMITS

Description of Discharge - Outfall 002 – Contributing flows to Outfall 002 include sanitary wastewater (0.58525 MGD), specialty polymers (Carbopol) wastewater (0.051 MGD), EDC/VCM process wastewater (0.4997 MGD), storm water runoff (0.0462 MGD), ethylene plant process wastewater (0.2714 MGD), and Cymetech stormwater, boiler feed water and cooling tower blowdown (0.0043 MGD – included above). The total flow to Outfall 001 is 1.4508 MGD.

Effluent Characteristics	Reported Discharge Monthly Average	Reported Discharge Daily Maximum	Proposed Limits Monthly Average	Proposed Limits Daily Maximum	Applicable Water Quality Criteria and/or Effluent Guidelines
Flow (MGD)	1.89	2.15	Report	Report	401 KAR 5:065, Section 2(8)
BOD_5 (lbs/day)	268	560	358	785	401 KAR 5:065, Sections 4 and 5 401 KAR 10:031, Section 4 401 KAR 5:045, Sections 3 and 5
Total Suspended Solids (lbs/day)	836	1,343	466	1,255	401 KAR 5:065, Sections 4 and 5 401 KAR 10:031, Section 4 401 KAR 5:045, Sections 2 and 3
Hardness (as mg/l $CaCO_3$)	130	169	Report	Report	401 KAR 5:065, Section 2(8)
Chloride (mg/l)	1,609	2,087	Report	Report	401 KAR 5:065, Section 2(8)
pH (Standard Units)	5.2 (min)	8.6 (max)	6.0 (min)	9.0 (max)	401 KAR 5:065, Sections 4 and 5 401 KAR 10:031, Section 4

5. REPORTED DISCHARGE AND PROPOSED LIMITS - continued

Effluent Characteristics	Reported Discharge Monthly Average	Reported Discharge Daily Maximum	Proposed Limits Monthly Average	Proposed Limits Daily Maximum	Applicable Water Quality Criteria and/or Effluent Guidelines
Acenaphthene (lbs/day)	0.163	0.248	0.151	0.404	401 KAR 5:065, Sections 4 and 5
Acenaphthylene (lbs/day)	0.332	0.676	0.151	0.404	401 KAR 5:065, Sections 4 and 5
Acrylonitrile (lbs/day)	N/R	N/R	0.658	1.658	401 KAR 5:065, Sections 4 and 5
Anthracene (lbs/day)	0.094	0.094	0.151	0.404	401 KAR 5:065, Sections 4 and 5
Benzene (lbs/day)	0.334	0.760	0.254	0.932	401 KAR 5:065, Sections 4 and 5
Benzo(a)anthracene (lbs/day)	0.124	0.124	0.151	0.404	401 KAR 5:065, Sections 4 and 5
3,4-Benzofluoranthene (lbs/day)	N/R	N/R	0.158	0.418	401 KAR 5:065, Sections 4 and 5
Benzo(k)fluoranthene (lbs/day)	N/R	N/R	0.151	0.404	401 KAR 5:065, Sections 4 and 5
Benzo(a)pyrene (lbs/day)	N/R	N/R	0.158	0.418	401 KAR 5:065, Sections 4 and 5
Bis(2-ethylhexyl) phthalate (lbs/day)	BDL	BDL	0.706	1.912	401 KAR 5:065, Sections 4 and 5
Carbon Tetrachloride (lbs/day)	N/R	N/R	0.123	0.260	401 KAR 5:065, Sections 4 and 5
Chlorobenzene (lbs/day)	N/R	N/R	0.103	0.192	401 KAR 5:065, Sections 4 and 5
Chloroethane (lbs/day)	N/R	N/R	0.713	1.837	401 KAR 5:065, Sections 4 and 5
Chloroform (lbs/day)	0.221	0.222	0.144	0.315	401 KAR 5:065, Sections 4 and 5
2-Chlorophenol (lbs/day)	N/R	N/R	0.212	0.672	401 KAR 5:065, Sections 4 and 5
Chrysene (lbs/day)	N/R	N/R	0.151	0.404	401 KAR 5:065, Sections 4 and 5
Di-n-butyl phthalate (lbs/day)	N/R	N/R	0.185	0.391	401 KAR 5:065, Sections 4 and 5
1,2-Dichlorobenzene (lbs/day)	N/R	N/R	0.528	1.117	401 KAR 5:065, Sections 4 and 5
1,3-Dichlorobenzene (lbs/day)	N/R	N/R	0.212	0.672	401 KAR 5:065, Sections 4 and 5
1,4-Dichlorobenzene (lbs/day)	N/R	N/R	0.103	0.192	401 KAR 5:065, Sections 4 and 5
1,1-Dichloroethane (lbs/day)	N/R	N/R	0.151	0.404	401 KAR 5:065, Sections 4 and 5
1,2-Dichloroethane (lbs/day)	1.600	4.654	0.466	1.446	401 KAR 5:065, Sections 4 and 5
1,1-Dichloroethylene (lbs/day)	N/R	N/R	0.110	0.171	401 KAR 5:065, Sections 4 and 5
1,2-trans-Dichloroethylene (lbs/day)	N/R	N/R	0.144	0.370	401 KAR 5:065, Sections 4 and 5
2,4-Dichlorophenol (lbs/day)	N/R	N/R	0.267	0.768	401 KAR 5:065, Sections 4 and 5
1,2-Dichloropropane (lbs/day)	N/R	N/R	0.576	1.048	401 KAR 5:065, Sections 4 and 5
1,3-Dichloropropylene (lbs/day)	N/R	N/R	0.199	0.302	401 KAR 5:065, Sections 4 and 5
Diethyl phthalate (lbs/day)	N/R	N/R	0.555	1.391	401 KAR 5:065, Sections 4 and 5
2,4-Dimethylphenol (lbs/day)	N/R	N/R	0.123	0.247	401 KAR 5:065, Sections 4 and 5
Dimethyl phthalate (lbs/day)	N/R	N/R	0.130	0.322	401 KAR 5:065, Sections 4 and 5
4,6-Dinitro-o-cresol (lbs/day)	N/R	N/R	0.535	1.898	401 KAR 5:065, Sections 4 and 5
2,4-Dinitrophenol (lbs/day)	N/R	N/R	0.487	0.843	401 KAR 5:065, Sections 4 and 5
2,4-Dinitrotoluene (lbs/day)	N/R	N/R	0.774	1.953	401 KAR 5:065, Sections 4 and 5

5. REPORTED DISCHARGE AND PROPOSED LIMITS - continued

Effluent Characteristics	Reported Discharge Monthly Average	Reported Discharge Daily Maximum	Proposed Limits Monthly Average	Proposed Limits Daily Maximum	Applicable Water Quality Criteria and/or Effluent Guidelines
2,6-Dinitrotoluene (lbs/day)	N/R	N/R	1.747	4.393	401 KAR 5:065, Sections 4 and 5
Ethylbenzene (lbs/day)	0.109	0.109	0.219	0.740	401 KAR 5:065, Sections 4 and 5
Fluoranthene (lbs/day)	N/R	N/R	0.171	0.466	401 KAR 5:065, Sections 4 and 5
Fluorene (lbs/day)	0.140	0.141	0.151	0.404	401 KAR 5:065, Sections 4 and 5
Hexachlorobenzene (lbs/day)	0.028	0.029	0.103	0.192	401 KAR 5:065, Sections 4 and 5
Hexachlorobutadiene (lbs/day)	N/R	N/R	0.137	0.336	401 KAR 5:065, Sections 4 and 5
Hexachloroethane (lbs/day)	N/R	N/R	0.144	0.370	401 KAR 5:065, Sections 4 and 5
Methyl Chloride (lbs/day)	N/R	N/R	0.589	1.302	401 KAR 5:065, Sections 4 and 5
Methylene Chloride (lbs/day)	N/R	N/R	0.274	0.610	401 KAR 5:065, Sections 4 and 5
Naphthalene (lbs/day)	0.753	1.830	0.151	0.404	401 KAR 5:065, Sections 4 and 5
Nitrobenzene (lbs/day)	N/R	N/R	0.185	0.466	401 KAR 5:065, Sections 4 and 5
2-Nitrophenol (lbs/day)	N/R	N/R	0.281	0.473	401 KAR 5:065, Sections 4 and 5
4-Nitrophenol (lbs/day)	N/R	N/R	0.493	0.850	401 KAR 5:065, Sections 4 and 5
Phenanthrene (lbs/day)	0.171	0.216	0.151	0.404	401 KAR 5:065, Sections 4 and 5
Phenol (lbs/day)	N/R	N/R	0.130	0.178	401 KAR 5:065, Sections 4 and 5
Pyrene (lbs/day)	0.144	0.144	0.171	0.459	401 KAR 5:065, Sections 4 and 5
Tetrachloroethylene (lbs/day)	BDL	BDL	0.151	0.384	401 KAR 5:065, Sections 4 and 5
Toluene (lbs/day)	0.340	0.535	0.178	0.548	401 KAR 5:065, Sections 4 and 5
Total Chromium (lbs/day)	0.063	0.063	7.607	18.983	401 KAR 5:065, Sections 4 and 5
Total Copper (lbs/day)	1.055	1.055	9.937	23.163	401 KAR 5:065, Sections 4 and 5
Total Cyanide (lbs/day)	N/R	N/R	2.878	8.223	401 KAR 5:065, Sections 4 and 5
Total Lead (lbs/day)	N/R	N/R	2.193	4.729	401 KAR 5:065, Sections 4 and 5
Total Nickel (lbs/day)	0.031	0.031	11.581	27.275	401 KAR 5:065, Sections 4 and 5
Total Zinc (lbs/day)	0.434	0.438	7.196	17.886	401 KAR 5:065, Sections 4 and 5
1,2,4-Trichlorobenzene (lbs/day)	N/R	N/R	0.466	0.959	401 KAR 5:065, Sections 4 and 5
1,1,1-Trichloroethane (lbs/day)	N/R	N/R	0.144	0.370	401 KAR 5:065, Sections 4 and 5
1,1,2-Trichloroethane (lbs/day)	0.803	0.806	0.144	0.370	401 KAR 5:065, Sections 4 and 5
Trichloroethylene (lbs/day)	N/R	N/R	0.144	0.370	401 KAR 5:065, Sections 4 and 5
Vinyl Chloride (lbs/day)	0.052	0.052	0.713	1.837	401 KAR 5:065, Sections 4 and 5

The data contained under the reported discharge columns are from the analysis of the DMR data that has been reported during the term of the current permit.

The abbreviation BOD_5 means Biochemical Oxygen Demand (5-day).
The abbreviation N/R means Not Reported.

6. METHODOLOGY USED IN DETERMINING LIMITATIONS

a. Serial Number

Outfall 002 – Contributing flows to Outfall 002 include sanitary wastewater (0.58525 MGD), specialty polymers (Carbopol) wastewater (0.051 MGD), EDC/VCM process wastewater (0.4997 MGD), storm water runoff (0.0462 MGD), ethylene plant process wastewater (0.2714 MGD), and Cymetech stormwater, boiler feed water and cooling tower blowdown (0.0043 MGD – included above). The total flow to Outfall 001 is 1.4508 MGD.

b. Effluent Characteristics

Flow	BOD_5
Total Suspended Solids	Hardness
Chloride	pH
Acenaphthene	Acenaphthylene
Acrylonitrile	Anthracene
Benzene	Benzo(a)anthracene
3,4-Benzofluoranthene	Benzo(k)fluoranthene
Benzo(a)pyrene	Bis(2-ethylhexyl) phthalate
Carbon Tetrachloride	Chlorobenzene
Chloroethane	Chloroform
2-Chlorophenol	Chrysene
Di-n-butyl phthalate	1,2-Dichlorobenzene
1,3-Dichlorobenzene	1,4-Dichlorobenzene
1,1-Dichloroethane	1,2-Dichloroethane
1,1-Dichloroethylene	1,2-trans-Dichloroethylene
2,4-Dichlorophenol	1,2-Dichloropropane
1,3-Dichloropropylene	Diethyl phthalate
2,4-Dimethylphenol	Dimethyl phthalate
4,6-Dinitro-o-cresol	2,4-Dinitrophenol
2,4-Dinitrotoluene	2,6-Dinitrotoluene
Ethylbenzene	Fluoranthene
Fluorene	Hexachlorobenzene
Hexachlorobutadiene	Hexachloroethane
Methyl Chloride	Methylene Chloride
Naphthalene	Nitrobenzene
2-Nitrophenol	4-Nitrophenol
Phenanthrene	Phenol
Pyrene	Tetrachloroethylene
Toluene	Total Chromium
Total Copper	Total Cyanide
Total Lead	Total Nickel
Total Zinc	1,2,4-Trichlorobenzene
1,1,1-Trichloroethane	1,1,2-Trichloroethane
Trichloroethylene	Vinyl Chloride

c. Pertinent Factors

Outfall 002 is an internal outfall to Outfall 001.

A summarization of the effluent guidelines, water quality standards, assumptions, and calculations can be found in Fact Sheet Attachment D – Regulatory Requirements.

6. METHODOLOGY USED IN DETERMINING LIMITATIONS - continued

c. Pertinent Factors - continued

The processes contributing to the flows from Outfall 002 are subject to the requirements of Subparts F, H, and I of 40 CFR Part 414 – Organic Chemicals, Plastics, and Synthetic Fibers Point Source Category. Specifically, the "Best Practicable Control Technology Currently Available" (BPT) for the Commodity Organic Chemicals Subcategory (40 CFR 414.61) and Specialty Organic Chemicals Subcategory (40 CFR 414.81), and the "Best Available Technology Economically Achievable" (BAT) for the Direct Discharge Point Sources That Use End-Of-Pipe Biological Treatment Subcategory (40 CFR 414.91).

d. Monitoring Requirements

Flow shall be monitored continuously by recorder.

Total Suspended Solids and BOD_5 shall be monitored once per week by 24-hour composite sample.

Total Zinc, Total Chromium, and Total Copper shall be monitored once per month by 24-hour composite sample.

Total Nickel and Total Lead shall be monitored once per year by 24-hour composite sample.

Hardness, Chloride, 1,2-Dichloroethane, and pH shall be monitored once per week by grab sample.

Acenaphthene, Acenaphthylene, Anthracene, Benzene, Benzo(a)anthracene, Bis(2-ethylhexyl) phthalate, Chloroform, Ethylbenzene, Fluorene, Hexachlorobenzene, Naphthalene, Phenanthrene, Pyrene, Tetrachloro-ethylene, Toluene, 1,1,2-Trichloroethane, and Vinyl Chloride shall be monitored once per month by grab sample.

Acrylonitrile, 3,4-Benzofluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Carbon Tetrachloride, Chlorobenzene, Chloroethane, 2-Chlorophenol, Chrysene, Di-n-butyl phthalate, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,1-Dichloroethane, 1,1-Dichloroethylene, 1,2-trans-Dichloroethylene, 2,4-Dichlorophenol, 1,2-Dichloropropane, 1,3-Dichloropropylene, Diethyl phthalate, 2,4-Dimethylphenol, Dimethyl phthalate, 4,6-Dinitro-o-cresol, 2,4-Dinitrophenol, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, Fluoranthene, Hexachlorobutadiene, Hexachloroethane, Methyl Chloride, Methylene Chloride, Nitrobenzene, 2-Nitrophenol, 4-Nitrophenol, Phenol, Total Cyanide, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, and Trichloroethylene shall be monitored once per year by grab sample.

e. Justification of Limits

The Kentucky Administrative Regulations (KARs) cited below have been duly promulgated pursuant to the requirements of Chapter 224 of the Kentucky Revised Statutes (KRSs).

6. METHODOLOGY USED IN DETERMINING LIMITATIONS - continued

e. Justification of Limits - continued

Internal Monitoring Requirement
Section 3(8) of 401 KAR 5:065 authorizes the establishment of internal monitoring points to ensure compliance with applicable treatment requirements, which when commingling with other wastestreams will prevent measuring compliance.

Flow, Hardness, and Chloride
The monitoring requirements for these parameters are consistent with the requirements of 401 KAR 5:065, Section 2(8).

Total Suspended Solids and BOD_5
The limits for these parameters are consistent with the requirements of 401 KAR 5:065, Sections 4 and 5 and 401 KAR 5:045. These limits are representative of the BPT requirements for the discharge of these pollutants resulting from the production of commodity and specialty organic chemicals as specified in 40 CFR Part 414.61 and 414.81

Acenaphthene, Acenaphthylene, Acrylonitrile, Anthracene, Benzene, Benzo(a)anthracene, 3,4-Benzofluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Bis(2-ethylhexyl) phthalate, Carbon Tetrachloride, Chlorobenzene, Chloroethane, Chloroform, 2-Chlorophenol, Chrysene, Di-n-butyl phthalate, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,1-Dichloroethane, 1,2-Dichloroethane, 1,1-Dichloroethylene, 1,2-trans-Dichloroethylene, 2,4-Dichlorophenol, 1,2-Dichloropropane, 1,3-Dichloropropylene, Diethyl phthalate, 2,4-Dimethylphenol, Dimethyl phthalate, 4,6-Dinitro-o-cresol, 2,4-Dinitrophenol, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, Ethylbenzene, Fluoranthene, Fluorene, Hexachlorobenzene, Hexachlorobutadiene, Hexachloroethane, Methyl Chloride, Methylene Chloride, Naphthalene, Nitrobenzene, 2-Nitrophenol, 4-Nitrophenol, Phenanthrene, Phenol, Pyrene, Tetrachloroethylene, Toluene, Total Chromium, Total Copper, Total Cyanide, Total Lead, Total Nickel, Total Zinc, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethylene, and Vinyl Chloride
The limitations for these parameters are consistent with the requirements of 401 KAR 5:065, Sections 4 and 5. These limits are representative of the BAT requirements for the Direct Discharge Point Sources That Use End-Of-Pipe Biological Treatment Subcategory (40 CFR 414.91).

pH
The limits for this parameter are consistent with the requirements of 401 KAR 10:031, Section 4 and 5:065, Sections 4 and 5. These limitations are representative of the BPT requirements for those activities associated with the production of commodity and specialty organic chemicals (40 CFR 414.61 and 414.81).

7. REPORTED DISCHARGE AND PROPOSED LIMITS

Description of Discharge - Outfall 003 – The contributing flow to Outfall 003 includes the Membrane Cell Chlor-Alkali Plant wastewater. Outfall 003 is an internal outfall to 001 (total flow to Outfall 001 is 0.3658 MGD).

Effluent Characteristics	Reported Discharge Monthly Average	Reported Discharge Daily Maximum	Proposed Limits Monthly Average	Proposed Limits Daily Maximum	Applicable Water Quality Criteria and/or Effluent Guidelines
Flow (MGD)	0.320	0.408	Report	Report	401 KAR 5:065, Section 2(8)
Total Suspended Solids (lbs/day)	56.5	106.8	Report	Report	401 KAR 5:065, Section 2(8)
Total Mercury (lbs/day)	0.014	0.031	Removing from Permit		401 KAR 5:080, Section 1(2)(c)2
Total Residual Chlorine (lbs/day)	0.030	0.103	Report	Report	401 KAR 5:065, Section 2(8)
pH (standard units)	5.2 (min)	9.0 (max)	6.0 (min)	9.0 (max)	401 KAR 10:031, Section 4

The data contained under the reported discharge columns are from the analysis of the DMR data that has been reported during the term of the current permit.

8. METHODOLOGY USED IN DETERMINING LIMITATIONS

a. Serial Number

Outfall 003 – The contributing flow to Outfall 003 includes the Membrane Cell Chlor-Alkali Plant wastewater. Outfall 003 is an internal outfall to 001 (total flow to Outfall 001 is 0.3658 MGD).

b. Effluent Characteristics

Flow	Total Suspended Solids
Total Residual Chlorine (TRC)	pH

c. Pertinent Factors

Outfall 003 is an internal outfall to Outfall 001.

A summarization water quality standards, assumptions, and calculations can be found in Fact Sheet Attachment D – Regulatory Requirements.

Westlake Vinyls, Inc. has converted to a Membrane Cell chlorine production system and is no longer operating a Mecury Cell system. The requirements of Subpart F (Chlor-Alkali Subcategory (Chlorine and Sodium or Potassium Hydroxide Production)) of 40 CFR Part 415 – Inorganic Chemicals Manufacturing Point Source Category no longer apply to this facility.

d. Monitoring Requirements

Flow shall be monitored instantaneously once per week.

Total Suspended Solids, Total Residual Chlorine, and pH shall be monitored once per week by grab sample.

e. Justification of Conditions

The Kentucky regulations cited below have been duly promulgated pursuant to the requirements of Chapter 224 of the Kentucky Revised Statutes.

Internal Monitoring Requirement
Section 3(8) of 401 KAR 5:065 authorizes the establishment of internal monitoring points to ensure compliance with applicable treatment requirements, which when commingling with other wastestreams will prevent measuring compliance.

Flow, Total Suspended Solids, and Total Residual Chlorine
The monitoring requirements for these parameters are consistent with the requirements of 401 KAR 5:065, Section 2(8).

pH
The limits for this parameter are consistent with the requirements of 401 KAR 10:031, Section 4.

8. METHODOLOGY USED IN DETERMINING LIMITATIONS - continued

e. Justification of Conditions - continued

Total Mercury

The removal of this parameter is consistent with the requirements of 401 KAR 5:080, Section 1(2)(c)2. The BPT and BAT requirements for discharges associated with Chlor-Alkali Mercury Cells as specified in 40 CFR Parts 415.62(a) and 415.63(a) do not apply. Chlorine is no longer being produced by Mercury Cells at this facility. Therefore, it is the "Best Professional Judgment" (BPJ) of the Division of Water that these parameters be removed from the permit.

9. REPORTED DISCHARGE AND PROPOSED LIMITS

Description of Discharge - Outfalls 004, 005, 006, 007, and 008 – No treatment of storm water runoff.

Effluent Characteristics	Reported Discharge		Proposed Limits		Applicable Water Quality Criteria and/or Effluent Guidelines
	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	

No limitations or monitoring are being proposed for these outfalls. It is the Best Professional Judgment of the Division of Water that control of these outfalls is better addressed through the facility's Best Management Practices (BMP) Plan.

10. METHODOLOGY USED IN DETERMINING LIMITATIONS

a. Serial Number

Outfalls 004, 005, 006, 007, and 008 – No treatment of storm water runoff.

b. Effluent Characteristics

None

c. Pertinent Factors

The Division of Water is removing these outfalls from the permit because it believes that control of these outfalls is better addressed through the facility's Best Management Practices (BMP) Plan.

d. Monitoring Requirements

None

e. Justification of Limits

The Kentucky Administrative Regulations (KARs) cited below have been duly promulgated pursuant to the requirements of Chapter 224 of the Kentucky Revised Statutes (KRSs).

Best Management Practices
The requirement to address the runoff from these outfalls within the facility's BMP Plan is consistent with the requirements of 401 KAR 5:065, Section 2(10)

11. REPORTED DISCHARGE AND PROPOSED LIMITS

Description of Discharge - Outfall 009 – The contributing flow includes aquifer water and leachate (1.512 MGD). This wastestream is treated prior to comingling with Outfalls 002 and 003 then discharged via Outfall 001 to the Tennessee River.

Effluent Characteristics	Reported Discharge Monthly Average	Reported Discharge Daily Maximum	Proposed Limits Monthly Average	Proposed Limits Daily Maximum	Applicable Water Quality Criteria and/or Effluent Guidelines
Flow (MGD)	N/R	N/R	Report	Report	401 KAR 5:065, Section 2(8)
BOD_5 (lbs/day)	N/R	N/R	379	1,009	401 KAR 5:065, Sections 4 and 5 401 KAR 10:031, Section 4
Total Suspended Solids (lbs/day)	N/R	N/R	580	1,880	401 KAR 5:065, Sections 4 and 5 401 KAR 10:031, Section 4
Hardness (as mg/l $CaCO_3$)	N/R	N/R	Report	Report	401 KAR 5:065, Section 2(8)
Chloride (mg/l)	N/R	N/R	Report	Report	401 KAR 5:065, Section 2(8)
pH (Standard Units)	N/R	N/R	6.0 (min)	9.0 (max)	401 KAR 5:065, Sections 4 and 5 401 KAR 10:031, Section 4

11. REPORTED DISCHARGE AND PROPOSED LIMITS - continued

Effluent Characteristics	Reported Discharge Monthly Average	Reported Discharge Daily Maximum	Proposed Limits Monthly Average	Proposed Limits Daily Maximum	Applicable Water Quality Criteria and/or Effluent Guidelines
Acenaphthene (lbs/day)	N/R	N/R	0.240	0.593	401 KAR 5:065, Sections 4 and 5
Acenaphthylene (lbs/day)	N/R	N/R	0.240	0.593	401 KAR 5:065, Sections 4 and 5
Acrylonitrile (lbs/day)	N/R	N/R	1.186	2.927	401 KAR 5:065, Sections 4 and 5
Anthracene (lbs/day)	N/R	N/R	0.240	0.593	401 KAR 5:065, Sections 4 and 5
Benzene (lbs/day)	N/R	N/R	0.719	1.691	401 KAR 5:065, Sections 4 and 5
Benzo(a)anthracene (lbs/day)	N/R	N/R	0.240	0.593	401 KAR 5:065, Sections 4 and 5
3,4-Benzofluoranthene (lbs/day)	N/R	N/R	0.252	0.606	401 KAR 5:065, Sections 4 and 5
Benzo(k)fluoranthene (lbs/day)	N/R	N/R	0.240	0.593	401 KAR 5:065, Sections 4 and 5
Benzo(a)pyrene (lbs/day)	N/R	N/R	0.252	0.606	401 KAR 5:065, Sections 4 and 5
Bis(2-ethylhexyl) phthalate (lbs/day)	N/R	N/R	1.199	3.255	401 KAR 5:065, Sections 4 and 5
Carbon Tetrachloride (lbs/day)	N/R	N/R	1.792	4.795	401 KAR 5:065, Sections 4 and 5
Chlorobenzene (lbs/day)	N/R	N/R	1.792	4.795	401 KAR 5:065, Sections 4 and 5
Chloroethane (lbs/day)	N/R	N/R	1.388	3.722	401 KAR 5:065, Sections 4 and 5
Chloroform (lbs/day)	N/R	N/R	1.401	4.101	401 KAR 5:065, Sections 4 and 5
Chrysene (lbs/day)	N/R	N/R	0.240	0.593	401 KAR 5:065, Sections 4 and 5
Di-n-butyl phthalate (lbs/day)	N/R	N/R	0.252	0.543	401 KAR 5:065, Sections 4 and 5
1,2-Dichlorobenzene (lbs/day)	N/R	N/R	2.473	10.018	401 KAR 5:065, Sections 4 and 5
1,3-Dichlorobenzene (lbs/day)	N/R	N/R	1.792	4.795	401 KAR 5:065, Sections 4 and 5
1,4-Dichlorobenzene (lbs/day)	N/R	N/R	1.792	4.795	401 KAR 5:065, Sections 4 and 5
1,1-Dichloroethane (lbs/day)	N/R	N/R	0.278	0.744	401 KAR 5:065, Sections 4 and 5
1,2-Dichloroethane (lbs/day)	N/R	N/R	2.271	7.234	401 KAR 5:065, Sections 4 and 5
1,1-Dichloroethylene (lbs/day)	N/R	N/R	0.278	0.757	401 KAR 5:065, Sections 4 and 5
1,2-trans-Dichloroethylene (lbs/day)	N/R	N/R	0.315	0.833	401 KAR 5:065, Sections 4 and 5
1,2-Dichloropropane (lbs/day)	N/R	N/R	2.473	10.018	401 KAR 5:065, Sections 4 and 5
1,3-Dichloropropylene (lbs/day)	N/R	N/R	2.473	10.018	401 KAR 5:065, Sections 4 and 5
Diethyl phthalate (lbs/day)	N/R	N/R	0.580	1.426	401 KAR 5:065, Sections 4 and 5
2,4-Dimethylphenol (lbs/day)	N/R	N/R	0.240	0.593	401 KAR 5:065, Sections 4 and 5
Dimethyl phthalate (lbs/day)	N/R	N/R	0.240	0.593	401 KAR 5:065, Sections 4 and 5
4,6-Dinitro-o-cresol (lbs/day)	N/R	N/R	0.984	3.495	401 KAR 5:065, Sections 4 and 5
2,4-Dinitrophenol (lbs/day)	N/R	N/R	15.229	54.142	401 KAR 5:065, Sections 4 and 5

11. REPORTED DISCHARGE AND PROPOSED LIMITS - continued

Effluent Characteristics	Reported Discharge Monthly Average	Reported Discharge Daily Maximum	Proposed Limits Monthly Average	Proposed Limits Daily Maximum	Applicable Water Quality Criteria and/or Effluent Guidelines
Ethylbenzene (lbs/day)	N/R	N/R	1.792	4.795	401 KAR 5:065, Sections 4 and 5
Fluoranthene (lbs/day)	N/R	N/R	0.278	0.681	401 KAR 5:065, Sections 4 and 5
Fluorene (lbs/day)	N/R	N/R	0.240	0.593	401 KAR 5:065, Sections 4 and 5
Hexachlorobenzene (lbs/day)	N/R	N/R	2.473	10.018	401 KAR 5:065, Sections 4 and 5
Hexachlorobutadiene (lbs/day)	N/R	N/R	1.792	4.795	401 KAR 5:065, Sections 4 and 5
Hexachloroethane (lbs/day)	N/R	N/R	2.473	10.018	401 KAR 5:065, Sections 4 and 5
Methyl Chloride (lbs/day)	N/R	N/R	1.388	3.722	401 KAR 5:065, Sections 4 and 5
Methylene Chloride (lbs/day)	N/R	N/R	0.454	2.145	401 KAR 5:065, Sections 4 and 5
Naphthalene (lbs/day)	N/R	N/R	0.240	0.593	401 KAR 5:065, Sections 4 and 5
Nitrobenzene (lbs/day)	N/R	N/R	28.226	80.778	401 KAR 5:065, Sections 4 and 5
2-Nitrophenol (lbs/day)	N/R	N/R	0.820	2.915	401 KAR 5:065, Sections 4 and 5
4-Nitrophenol (lbs/day)	N/R	N/R	2.044	7.268	401 KAR 5:065, Sections 4 and 5
Phenanthrene (lbs/day)	N/R	N/R	0.240	0.593	401 KAR 5:065, Sections 4 and 5
Phenol (lbs/day)	N/R	N/R	0.240	0.593	401 KAR 5:065, Sections 4 and 5
Pyrene (lbs/day)	N/R	N/R	0.252	0.606	401 KAR 5:065, Sections 4 and 5
Tetrachloroethylene (lbs/day)	N/R	N/R	0.656	2.069	401 KAR 5:065, Sections 4 and 5
Toluene (lbs/day)	N/R	N/R	0.353	0.934	401 KAR 5:065, Sections 4 and 5
Total Chromium (lbs/day)	N/R	N/R	14.006	34.951	401 KAR 5:065, Sections 4 and 5
Total Copper (lbs/day)	N/R	N/R	18.296	42.648	401 KAR 5:065, Sections 4 and 5
Total Cyanide (lbs/day)	N/R	N/R	5.299	15.141	401 KAR 5:065, Sections 4 and 5
Total Lead (lbs/day)	N/R	N/R	4.038	8.706	401 KAR 5:065, Sections 4 and 5
Total Nickel (lbs/day)	N/R	N/R	21.324	50.218	401 KAR 5:065, Sections 4 and 5
Total Zinc (lbs/day)	N/R	N/R	13.249	32.932	401 KAR 5:065, Sections 4 and 5
1,2,4-Trichlorobenzene (lbs/day)	N/R	N/R	2.473	10.018	401 KAR 5:065, Sections 4 and 5
1,1,1-Trichloroethane (lbs/day)	N/R	N/R	0.278	0.744	401 KAR 5:065, Sections 4 and 5
1,1,2-Trichloroethane (lbs/day)	N/R	N/R	0.404	1.602	401 KAR 5:065, Sections 4 and 5
Trichloroethylene (lbs/day)	N/R	N/R	0.328	0.871	401 KAR 5:065, Sections 4 and 5
Vinyl Chloride (lbs/day)	N/R	N/R	1.224	2.170	401 KAR 5:065, Sections 4 and 5

The data contained under the reported discharge columns are from the analysis of the DMR data that has been reported during the term of the current permit.

The abbreviation BOD_5 means Biochemical Oxygen Demand (5-day).
The abbreviation N/R means Not Reported.

12. METHODOLOGY USED IN DETERMINING LIMITATIONS

a. Serial Number

Outfall 009 – The contributing flow includes aquifer water and leachate (1.512 MGD). This wastestream is treated prior to comingling with Outfalls 002 and 003 then discharged via Outfall 001 to the Tennessee River.

b. Effluent Characteristics

Flow	BOD_5
Total Suspended Solids	Hardness
Chloride	pH
Acenaphthene	Acenaphthylene
Acrylonitrile	Anthracene
Benzene	Benzo(a)anthracene
3,4-Benzofluoranthene	Benzo(k)fluoranthene
Benzo(a)pyrene	Bis(2-ethylhexyl) phthalate
Carbon Tetrachloride	Chlorobenzene
Chloroethane	Chloroform
Chrysene	Di-n-butyl phthalate
1,2-Dichlorobenzene	1,3-Dichlorobenzene
1,4-Dichlorobenzene	1,1-Dichloroethane
1,2-Dichloroethane	1,1-Dichloroethylene
1,2-trans-Dichloroethylene	1,2-Dichloropropane
1,3-Dichloropropylene	Diethyl phthalate
2,4-Dimethylphenol	Dimethyl phthalate
4,6-Dinitro-o-cresol	2,4-Dinitrophenol
Ethylbenzene	Fluoranthene
Fluorene	Hexachlorobenzene
Hexachlorobutadiene	Hexachloroethane
Methyl Chloride	Methylene Chloride
Naphthalene	Nitrobenzene
2-Nitrophenol	4-Nitrophenol
Phenanthrene	Phenol
Pyrene	Tetrachloroethylene
Toluene	Total Chromium
Total Copper	Total Cyanide
Total Lead	Total Nickel
Total Zinc	1,2,4-Trichlorobenzene
1,1,1-Trichloroethane	1,1,2-Trichloroethane
Trichloroethylene	Vinyl Chloride

c. Pertinent Factors

Outfall 009 is an internal outfall to Outfall 001.

A summarization of the effluent guidelines, water quality standards, assumptions, and calculations can be found in Fact Sheet Attachment D – Regulatory Requirements.

12. METHODOLOGY USED IN DETERMINING LIMITATIONS - continued

c. Pertinent Factors - continued

The processes contributing to the flows from Outfall 009 are subject to the requirements of Subparts F, H, and I of 40 CFR Part 414 – Organic Chemicals, Plastics, and Synthetic Fibers Point Source Category. Specifically, the "Best Practicable Control Technology Currently Available" (BPT) for the Commodity Organic Chemicals Subcategory (40 CFR 414.61), and the "Best Available Technology Economically Achievable" (BAT) for the Direct Discharge Point Sources That Use No End-Of-Pipe Biological Treatment Subcategory (40 CFR 414.101).

d. Monitoring Requirements

Flow shall be monitored continuously by recorder.

Total Suspended Solids and BOD_5 shall be monitored once per week by 24-hour composite sample.

Total Zinc, Total Chromium, and Total Copper shall be monitored once per month by 24-hour composite sample.

Total Nickel and Total Lead shall be monitored once per year by 24-hour composite sample.

Hardness, Chloride, 1,2-Dichloroethane, and pH shall be monitored once per week by grab sample.

Acenaphthene, Acenaphthylene, Anthracene, Benzene, Benzo(a)anthracene, Bis(2-ethylhexyl) phthalate, Chloroform, Ethylbenzene, Fluorene, Hexachlorobenzene, Naphthalene, Phenanthrene, Pyrene, Tetrachloro-ethylene, Toluene, 1,1,2-Trichloroethane, and Vinyl Chloride shall be monitored once per month by grab sample.

Acrylonitrile, 3,4-Benzofluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Carbon Tetrachloride, Chlorobenzene, Chloroethane, Chrysene, Di-n-butyl phthalate, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,1-Dichloroethane, 1,2-Dichloroethane, 1,1-Dichloroethylene, 1,2-trans-Dichloroethylene, 1,2-Dichloropropane, 1,3-Dichloropropylene, Diethyl phthalate, 2,4-Dimethylphenol, Dimethyl phthalate, 4,6-Dinitro-o-cresol, 2,4-Dinitrophenol, Fluoranthene, Hexachlorobutadiene, Hexachloroethane, Methyl Chloride, Methylene Chloride, Nitrobenzene, 2-Nitrophenol, 4-Nitrophenol, Phenol, Total Cyanide, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, and Trichloroethylene shall be monitored once per year by grab sample.

e. Justification of Limits

The Kentucky Administrative Regulations (KARs) cited below have been duly promulgated pursuant to the requirements of Chapter 224 of the Kentucky Revised Statutes (KRSs).

12. METHODOLOGY USED IN DETERMINING LIMITATIONS - continued

e. Justification of Limits - continued

Internal Monitoring Requirement
Section 3(8) of 401 KAR 5:065 authorizes the establishment of internal monitoring points to ensure compliance with applicable treatment requirements, which when commingling with other wastestreams will prevent measuring compliance.

Flow, Hardness, and Chloride
The monitoring requirements for these parameters are consistent with the requirements of 401 KAR 5:065, Section 2(8).

Total Suspended Solids and BOD_5
The limits for these parameters are consistent with the requirements of 401 KAR 5:065, Sections 4 and 5 and 401 KAR 5:045. These limits are representative of the BPT requirements for the discharge of these pollutants resulting from the production of commodity organic chemicals as specified in 40 CFR Part 414.61.

Acenaphthene, Acenaphthylene, Acrylonitrile, Anthracene, Benzene, Benzo(a)anthracene, 3,4-Benzofluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Bis(2-ethylhexyl) phthalate, Carbon Tetrachloride, Chlorobenzene, Chloroethane, Chloroform, Chrysene, Di-n-butyl phthalate, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,1-Dichloroethane, 1,2-Dichloroethane, 1,1-Dichloroethylene, 1,2-trans-Dichloroethylene, 1,2-Dichloropropane, 1,3-Dichloropropylene, Diethyl phthalate, 2,4-Dimethylphenol, Dimethyl phthalate, 4,6-Dinitro-o-cresol, 2,4-Dinitrophenol, Ethylbenzene, Fluoranthene, Fluorene, Hexachloro-benzene, Hexachlorobutadiene, Hexachloroethane, Methyl Chloride, Methylene Chloride, Naphthalene, Nitrobenzene, 2-Nitrophenol, 4-Nitrophenol, Phenanthrene, Phenol, Pyrene, Tetrachloroethylene, Toluene, Total Chromium, Total Copper, Total Cyanide, Total Lead, Total Nickel, Total Zinc, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethylene, and Vinyl Chloride
The limitations for these parameters are consistent with the requirements of 401 KAR 5:06, Sections 4 and 5. These limits are representative of the BAT requirements for the Direct Discharge Point Sources That Use No End-Of-Pipe Biological Treatment Subcategory (40 CFR 414.101).

pH
The limits for this parameter are consistent with the requirements of 401 KAR 10:031, Section 4 and 5:065, Sections 4 and 5. These limitations are representative of the BPT requirements for those activities associated with the production of commodity organic chemicals (40 CFR 414.61).

13. ANTIDEGRADATION

The conditions of 401 KAR 10:029, Section 1 have been satisfied by this permit action. Since this permit action involves reissuance of an existing permit, and does not propose an expanded discharge, a review under 401 KAR 10:030 Section 1 is not applicable.

14. PROPOSED COMPLIANCE SCHEDULE FOR ATTAINING EFFLUENT LIMITATIONS

The permittee shall comply with the effluent limitations and permit conditions by the effective of the permit.

15. PROPOSED SPECIAL CONDITIONS WHICH WILL HAVE A SIGNIFICANT IMPACT ON THE DISCHARGE

Best Management Practices (BMP) Plan
Pursuant to 401 KAR 5:065, Section 2(10), a BMP requirement shall be included: to control or abate the discharge of pollutants from ancillary areas containing toxic or hazardous substances or those substances which could result in an environmental emergency; where numeric effluent limitations are infeasible; or to carry out the purposes and intent of KRS 224. The facility has several areas where support activities occur which have a potential of the discharge of such substances through storm water runoff or spillage. Some of these areas will drain to present wastewater treatment plants, others will not.

Cooling Water Additives, FIFRA, and Mollusk Control
The discharge of any product registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) in cooling water which ultimately may be released to the waters of the Commonwealth is prohibited, except Herbicides, unless specifically identified and authorized by the KPDES permit. In the event the permittee needs to use a biocide or chemical not previously reported for mollusk control or other purpose, the permittee shall submit sufficient information, a minimum of thirty (30) days prior to the commencement of use of said biocides or chemicals to the Division of Water for review and establishment of appropriate control parameters.

Rainfall and Storm Water Runoff Monitoring Requirements
The permittee shall maintain daily records of rainfall at the plant site. Samples shall be taken as soon as practicable upon commencement of discharge.

Mixing Zone
Westlake Vinyls has requested a mixing zone in the vicinity of the proposed discharge for Temperature, Chloride, Total Residual Chlorine, 1,2-Dichloroethane, 1,1,2-Trichlorethane, Total Recoverable Copper, Total Recoverable Mercury, and Hexachlorobenzene. Pursuant to the requirements of 401 KAR 10:029, Section 4(6) an assigned mixing zone can not exceed 1/3 of the width of the receiving water body in a spatial direction. At the proposed point of discharge the width of the Tennessee River is 1200 feet therefore an assigned mixing zone for these pollutants can not exceed 400 feet in a spatial direction. In accordance with the requirements of 401 KAR 10:029, Section 4(1) the mixing zones shall have the following dimensions:

15. PROPOSED SPECIAL CONDITIONS WHICH WILL HAVE A SIGNIFICANT IMPACT ON THE DISCHARGE - continued

Mixing Zone – continued

Temperature:

Linear Distance from Point of Discharge:	0.045 feet in any direction
Maximum Surface Area Involved:	0.0016 square feet
Volume of Receiving Water	500 cfs (323 MGD)

Chloride, Total Residual Chlorine, 1,2-Dichloroethane, 1,1,2-Trichlorethane, Total Recoverable Copper, Total Recoverable Mercury, and Hexachlorobenzene:

Linear Distance from Point of Discharge:	86.1 feet in any direction
Maximum Surface Area Involved:	5,829 square feet
Volume of Receiving Water	500 cfs (323 MGD)

Calculation of Zone of Initial Dilution (ZID) and Dilutions:
Pursuant to 401 KAR 10:029, Section 4, the ZID is equal to the most restrictive of the following three cases:

a) 10% of the sidtance from the edge of the outfall structure to the edge of the refulatory mixing zone in a spatial direction
= (0.10)*(86.1 ft.) = 8.61 ft.

b) 50 times the square root of the cross-sectional area of a discharge port, in a spatial direction
= $(50)*[(\pi/2)*(0.0762m)^2]^{1/2}$ = 4.78 m = 15.67 ft.

c) 5 times the natural water depth that prevails under mixing zone design conditions
= (5)*(3.5m) = 17.5 m = 57.41 ft.

In this case the ZID is equal to 8.61 ft. Using lnear regression and the dilutions provided from the CORMIX modeling, the dilutions at 8.61 ft is 10.02. This dilution factor applies to Chloride, Total Residual Chlorine, 1,2-Dichloroethane, 1,1,2-Trichlorethane, Total Recoverable Copper, Total Recoverable Mercury, and Hexachlorobenzene.

Outfall Signage
As a member of ORSANCO (Ohio River Valley Sanitation Commission) the Commonwealth of Kentucky through the Division of Water implements a requirement that the permittee post a permanent marker at each discharge point to the Ohio River. It is the Best Professional Judgment of the Division of Water, 401 KAR 5:080, Section 1(2)(c)2, that all permittees post a marker at all discharge locations and/or monitoring points. The ORSANCO requirements for the marker specify it to be at least 2 feet by 2 feet in size and a minimum of 3 feet above ground level with the Permittee Name and KPDES permit and outfall numbers in 2 inch letters. For internal monitoring points the marker shall be of sufficient size to include the outfall number in 2 inch letters and is to be posted as near as possible to the actual sampling location.

16. PERMIT DURATION

Five (5) years. This facility is in the Four Rivers, Upper & Lower Cumberland River Basin Management Unit as per the Kentucky Watershed Management Framework.

17. PERMIT INFORMATION

The application, draft permit fact sheet, public notice, comments received, and additional information is available by writing the Division of Water at 200 Fair Oaks Lane, Frankfort, Kentucky 40601.

18. REFERENCES AND CITED DOCUMENTS

All material and documents referenced or cited in this fact sheet are a part of the permit information as described above and are readily available at the Division of Water Central Office. Information regarding these materials may be obtained from the person listed below.

19. CONTACT

For further information contact the individual identified on the Public Notice or the Permit Writer – Sara Beard at (502) 564-3410, extension 4925 or e-mail Sara.Beard@ky.gov.

20. PUBLIC NOTICE INFORMATION

Please refer to the attached Public Notice for details regarding the procedures for a final permit decision, deadline for comments and other information required by KAR 5:075, Section 4(2)(e).

KPDES

KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM

PERMIT

PERMIT NO.: KY0003484
AI No.: 2966

AUTHORIZATION TO DISCHARGE UNDER THE KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM

Pursuant to Authority in KRS 224,

Westlake Vinyls, Inc.
P.O. Box 712
Calvert City, Kentucky 42029

is authorized to discharge from a facility located at

Westlake Vinyls, Inc.
2672 Industrial Parkway
Calvert City, Marshall County, Kentucky

to receiving waters named

Outfall 001 discharges to the Tennessee River at the following coordinates: N 37° 03′ 19″, W 88° 19′ 51″. Outfalls 002, 003, and 009 are internal outfalls to 001.

in accordance with effluent limitations, monitoring requirements and other conditions set forth in PARTS I, II, III, IV, and V hereof. The permit consists of this cover sheet, and PART I 11 pages, PART II 1 page, PART III 1 page, PART IV 3 pages, and PART V 3 pages.

This permit shall become effective on

This permit and the authorization to discharge shall expire at midnight,

Date Signed

Sandra L. Gruzesky, Director
Division of Water

A1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the term of this permit, the permittee is authorized to discharge from Outfall serial number: 001 - Contributing flows to Outfall 001 include cooling tower blowdown (0.5195 MGD), boilerhouse water (0.068 MGD), sand filter backwash (0.347 MGD), sanitary facilities and barge eyewash stations (0.03275 MGD), miscellaneous uses of water (office air conditioner cooling water, boiler blowdown, incinerator blowdown, scrubber discharge, hoses, etc. – 0.2488 MGD), Chlor-Alkali utility building discharge (compressor cooling water and deionizer blowdown – 0.0679 MGD), storm water runoff (0.0732 MGD), Outfall 002 wastewater (0.9948 MGD), Outfall 003 wastewater (0.3658 MGD), and Outfall 009 wastewater (1.512 MGD). All process wastewater and sanitary wastewater streams are treated and then combined with all other wastestreams prior to discharge to the Tennessee River at a rate of 4.2042 MGD.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	Monthly Avg.	Daily Max.	Measurement Frequency	Sample Type
Flow (MGD)	Report	Report	Continuous	Recorder
Temperature (^{o}F)	95.0	100.0	1/Week	Grab
Oil & Grease (mg/l)	10	15	1/Week	Grab
Hardness (as mg/l $CaCO_3$)	Report	Report	1/Week	Grab
Chloride (mg/l)	3,000	6,000	1/Week	Grab
Total Residual Chlorine (mg/l)	0.19	0.19	1/Week	Grab
Acute Toxicity (TU_a)	Report	4.05	1/Quarter	2 Grabs
Total Recoverable Mercury (mg/l)			1/Week	Grab
Tier 1	0.017	0.017		
Tier 2	0.017	0.017		
Tier 3	0.000051	0.0017		
1,2-Dichloroethane (mg/l)	Report	Report	1/Month	Grab
Benzene (mg/l)	Removing from Permit			
Chloroform (mg/l)	Removing from Permit			
Ethylbenzene (mg/l)	Report	Report	1/Month	Grab
Tetrachloroethylene (mg/l)	Report	Report	1/Month	Grab
Toluene (mg/l)	Removing from Permit			
1,1,2-Trichloroethane (mg/l)	Report	Report	1/Month	Grab
Vinyl Chloride (mg/l)	Report	Report	1/Month	Grab
Anthracene (mg/l)	Report	Report	1/Month	Grab
Fluorene (mg/l)	Removing from Permit			
Hexachlorobenzene (mg/l)			1/Month	Grab
Tier 1	0.0015	0.0015		
Tier 2	0.000128	Report		
Tier 3	$2.9x10^{-7}$	Report		

A1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS - continued

Phenanthrene (mg/l)	Report	Report	1/Month	Grab
Pyrene (mg/l)	Report	Report	1/Month	Grab
Chromium (Hexavalent) (mg/l)	Removing from Permit			
Total Recoverable Copper (mg/l)	0.15	0.15	1/Month	Grab
Total Recoverable Zinc (mg/l)	Removing from Permit			

The pH of the effluent shall not be less than 6.0 standard units or greater than 9.0 standard units, and shall be monitored 1/week by grab sample.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: nearest accessible point after final treatment, but prior to actual discharge to or mixing with the wastestreams from other outfalls.

There shall be no discharge of floating solids or visible foam or sheen in other than trace amounts.

Tier 1 – Tier 1 limits apply during the period of time between the permit effective date and three years from that date.

Tier 2 – Tier 2 limits apply during the period of time between the end of Tier 1 (three years from the effective date of the permit) and September 8, 2014.

Tier 3 – Tier 3 limits apply after September 8, 2014.

A2. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the term of this permit, the permittee is authorized to discharge from Outfall serial number: Outfall 002 – Contributing flows to Outfall 002 include sanitary wastewater (0.58525 MGD), specialty polymers (Carbopol) wastewater (0.051 MGD), EDC/VCM process wastewater (0.4997 MGD), storm water runoff (0.0462 MGD), and ethylene plant process wastewater (0.2714 MGD). Outfall 002 is an internal outfall to 001 (total flow to Outfall 001 is 1.4508 MGD).

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	Monthly Avg.	Daily Max.	Measurement Frequency	Sample Type
Flow (MGD)	Report	Report	Continuous	Recorder
BOD_5 (lbs/day)	358	785	1/Week	24-hr Composite
Total Suspended Solids (lbs/day)	466	1,255	1/Week	24-hr Composite
Hardness (as mg/l $CaCO_3$)	Report	Report	1/Week	Grab
Chloride (mg/l)	Report	Report	1/Week	Grab
Acenaphthene (lbs/day)	0.151	0.404	1/Month	Grab
Acenaphthylene (lbs/day)	0.151	0.404	1/Month	Grab
Acrylonitrile (lbs/day)	0.658	1.658	1/Year	Grab
Anthracene (lbs/day)	0.151	0.404	1/Month	Grab
Benzene (lbs/day)	0.254	0.932	1/Month	Grab
Benzo(a)anthracene (lbs/day)	0.151	0.404	1/Month	Grab
3,4-Benzofluoranthene (lbs/day)	0.158	0.418	1/Year	Grab
Benzo(k)fluoranthene (lbs/day)	0.151	0.404	1/Year	Grab
Benzo(a)pyrene (lbs/day)	0.158	0.418	1/Year	Grab
Bis(2-ethylhexyl) phthalate (lbs/day)	0.706	1.912	1/Month	Grab
Carbon Tetrachloride (lbs/day)	0.123	0.260	1/Year	Grab
Chlorobenzene (lbs/day)	0.103	0.192	1/Year	Grab
Chloroethane (lbs/day)	0.713	1.837	1/Year	Grab
Chloroform (lbs/day)	0.144	0.315	1/Month	Grab
2-Chlorophenol (lbs/day)	0.212	0.672	1/Year	Grab
Chrysene (lbs/day)	0.151	0.404	1/Year	Grab
Di-n-butyl phthalate (lbs/day)	0.185	0.391	1/Year	Grab
1,2-Dichlorobenzene (lbs/day)	0.528	1.117	1/Year	Grab
1,3-Dichlorobenzene (lbs/day)	0.212	0.672	1/Year	Grab
1,4-Dichlorobenzene (lbs/day)	0.103	0.192	1/Year	Grab
1,1-Dichloroethane (lbs/day)	0.151	0.404	1/Year	Grab
1,2-Dichloroethane (lbs/day)	0.466	1.446	1/Week	Grab
1,1-Dichloroethylene (lbs/day)	0.110	0.171	1/Year	Grab

A2. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS - continued

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	Monthly Avg.	Daily Max.	Measurement Frequency	Sample Type
1,2-trans-Dichloroethylene (lbs/day)	0.144	0.370	1/Year	Grab
2,4-Dichlorophenol (lbs/day)	0.267	0.768	1/Year	Grab
1,2-Dichloropropane (lbs/day)	0.576	1.048	1/Year	Grab
1,3-Dichloropropylene (lbs/day)	0.199	0.302	1/Year	Grab
Diethyl phthalate (lbs/day)	0.555	1.391	1/Year	Grab
2,4-Dimethylphenol (lbs/day)	0.123	0.247	1/Year	Grab
Dimethyl phthalate (lbs/day)	0.130	0.322	1/Year	Grab
4,6-Dinitro-o-cresol (lbs/day)	0.535	1.898	1/Year	Grab
2,4-Dinitrophenol (lbs/day)	0.487	0.843	1/Year	Grab
2,4-Dinitrotoluene (lbs/day)	0.774	1.953	1/Year	Grab
2,6-Dinitrotoluene (lbs/day)	1.747	4.393	1/Year	Grab
Ethylbenzene (lbs/day)	0.219	0.740	1/Month	Grab
Fluoranthene (lbs/day)	0.171	0.466	1/Year	Grab
Fluorene (lbs/day)	0.151	0.404	1/Month	Grab
Hexachlorobenzene (lbs/day)	0.103	0.192	1/Month	Grab
Hexachlorobutadiene (lbs/day)	0.137	0.336	1/Year	Grab
Hexachloroethane (lbs/day)	0.144	0.370	1/Year	Grab
Methyl Chloride (lbs/day)	0.589	1.302	1/Year	Grab
Methylene Chloride (lbs/day)	0.274	0.610	1/Year	Grab
Naphthalene (lbs/day)	0.151	0.404	1/Month	Grab
Nitrobenzene (lbs/day)	0.185	0.466	1/Year	Grab
2-Nitrophenol (lbs/day)	0.281	0.473	1/Year	Grab
4-Nitrophenol (lbs/day)	0.493	0.850	1/Year	Grab
Phenanthrene (lbs/day)	0.151	0.404	1/Month	Grab
Phenol (lbs/day)	0.130	0.178	1/Year	Grab
Pyrene (lbs/day)	0.171	0.459	1/Month	Grab
Tetrachloroethylene (lbs/day)	0.151	0.384	1/Month	Grab
Toluene (lbs/day)	0.178	0.548	1/Month	Grab
Total Chromium (lbs/day)	7.607	18.983	1/Month	24-hr Composite
Total Copper (lbs/day)	9.937	23.163	1/Month	24-hr Composite
Total Cyanide (lbs/day)	2.878	8.223	1/Year	Grab
Total Lead (lbs/day)	2.193	4.729	1/Year	24-hr Composite
Total Nickel (lbs/day)	11.581	27.275	1/Year	24-hr Composite
Total Zinc (lbs/day)	7.196	17.886	1/Month	24-hr Composite
1,2,4-Trichlorobenzene (lbs/day)	0.466	0.959	1/Year	Grab

A2. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS - continued

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	Monthly Avg.	Daily Max.	Measurement Frequency	Sample Type
1,1,1-Trichloroethane (lbs/day)	0.144	0.370	1/Year	Grab
1,1,2-Trichloroethane (lbs/day)	0.144	0.370	1/Month	Grab
Trichloroethylene (lbs/day)	0.144	0.370	1/Year	Grab
Vinyl Chloride (lbs/day)	0.713	1.837	1/Month	Grab

The pH of the effluent shall not be less than 6.0 standard units or greater than 9.0 standard units and shall be monitored 1/Week by grab sample.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: nearest accessible point after final treatment, but prior to actual discharge to or mixing with the receiving waters or wastestreams from other outfalls.

There shall be no discharge of floating solids or visible foam or sheen in other than trace amounts.

The abbreviation BOD_5 means Biochemical Oxygen Demand (5-day).

A3. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the term of this permit, the permittee is authorized to discharge from Outfall serial number: 003 - The contributing flow to Outfall 003 includes the Membrane Cell Chlor-Alkali Plant wastewater. Outfall 003 is an internal outfall to 001 (total flow to Outfall 001 is 0.3658 MGD).

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	Monthly Avg.	Daily Max.	Measurement Frequency	Sample Type
Flow (MGD)	Report	Report	1/Week	Instantaneous
Total Suspended Solids (lbs/day)	Report	Report	1/Week	Grab
Total Mercury (lbs/day)	Removing from Permit		1/Week	24-hr Composite
Total Residual Chlorine (lbs/day)	Report	Report	1/Week	Grab

The pH of the effluent shall not be less than 6.0 standard units or greater than 9.0 standard units and shall be monitored 1/Week by grab sample.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: nearest accessible point after final treatment, but prior to actual discharge to or mixing with other wastewaters.

There shall be no discharge of floating solids or visible foam or sheen in other than trace amounts.

A4. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the term of this permit, the permittee is authorized to discharge from Outfall serial numbers: 004, 005, 006, 007, and 008 – No treatment of storm water runoff.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	Monthly Avg.	Daily Max.	Measurement Frequency	Sample Type

No limitations or monitoring are being proposed for these outfalls. It is the Best Professional Judgment of the Division of Water that control of these outfalls is better addressed through the facility's Best Management Practices (BMP) Plan.

A5. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the term of this permit, the permittee is authorized to discharge from Outfall serial number: Outfall 009 – The contributing flow includes aquifer water and leachate (1.512 MGD). This wastestream is treated prior to comingling with Outfalls 002 and 003 then discharged via Outfall 001 to the Tennessee River.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	Monthly Avg.	Daily Max.	Measurement Frequency	Sample Type
Flow (MGD)	Report	Report	Continuous	Recorder
BOD_5 (lbs/day)	379	1,009	1/Week	24-hr Composite
Total Suspended Solids (lbs/day)	580	1,880	1/Week	24-hr Composite
Hardness (as mg/l $CaCO_3$)	Report	Report	1/Week	Grab
Chloride (mg/l)	Report	Report	1/Week	Grab
Acenaphthene (lbs/day)	0.240	0.593	1/Month	Grab
Acenaphthylene (lbs/day)	0.240	0.593	1/Month	Grab
Acrylonitrile (lbs/day)	1.186	2.927	1/Year	Grab
Anthracene (lbs/day)	0.240	0.593	1/Month	Grab
Benzene (lbs/day)	0.719	1.691	1/Month	Grab
Benzo(a)anthracene (lbs/day)	0.240	0.593	1/Month	Grab
3,4-Benzofluoranthene (lbs/day)	0.252	0.606	1/Year	Grab
Benzo(k)fluoranthene (lbs/day)	0.240	0.593	1/Year	Grab
Benzo(a)pyrene (lbs/day)	0.22	0.606	1/Year	Grab
Bis(2-ethylhexyl) phthalate (lbs/day)	1.199	3.255	1/Month	Grab
Carbon Tetrachloride (lbs/day)	1.792	4.795	1/Year	Grab
Chlorobenzene (lbs/day)	1.792	4.795	1/Year	Grab
Chloroethane (lbs/day)	1.388	3.722	1/Year	Grab
Chloroform (lbs/day)	1.401	4.101	1/Month	Grab
Chrysene (lbs/day)	0.240	0.593	1/Year	Grab
Di-n-butyl phthalate (lbs/day)	0.252	0.543	1/Year	Grab
1,2-Dichlorobenzene (lbs/day)	2.473	10.018	1/Year	Grab
1,3-Dichlorobenzene (lbs/day)	1.792	4.795	1/Year	Grab
1,4-Dichlorobenzene (lbs/day)	1.792	4.795	1/Year	Grab
1,1-Dichloroethane (lbs/day)	0.278	0.744	1/Year	Grab
1,2-Dichloroethane (lbs/day)	2.271	7.243	1/Week	Grab
1,1-Dichloroethylene (lbs/day)	0.278	0.757	1/Year	Grab

A5. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS - continued

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	Monthly Avg.	Daily Max.	Measurement Frequency	Sample Type
1,2-trans-Dichloroethylene (lbs/day)	0.315	0.833	1/Year	Grab
1,2-Dichloropropane (lbs/day)	2.473	10.018	1/Year	Grab
1,3-Dichloropropylene (lbs/day)	2.473	10.018	1/Year	Grab
Diethyl phthalate (lbs/day)	0.580	1.426	1/Year	Grab
2,4-Dimethylphenol (lbs/day)	0.240	0.593	1/Year	Grab
Dimethyl phthalate (lbs/day)	0.240	0.593	1/Year	Grab
4,6-Dinitro-o-cresol (lbs/day)	0.984	3.495	1/Year	Grab
2,4-Dinitrophenol (lbs/day)	15.229	54.142	1/Year	Grab
Ethylbenzene (lbs/day)	1.792	4.795	1/Month	Grab
Fluoranthene (lbs/day)	0.278	0.681	1/Year	Grab
Fluorene (lbs/day)	0.240	0.593	1/Month	Grab
Hexachlorobenzene (lbs/day)	2.473	10.018	1/Month	Grab
Hexachlorobutadiene (lbs/day)	1.792	4.795	1/Year	Grab
Hexachloroethane (lbs/day)	2.473	10.018	1/Year	Grab
Methyl Chloride (lbs/day)	1.388	3.722	1/Year	Grab
Methylene Chloride (lbs/day)	0.454	2.145	1/Year	Grab
Naphthalene (lbs/day)	0.240	0.593	1/Month	Grab
Nitrobenzene (lbs/day)	28.226	80.778	1/Year	Grab
2-Nitrophenol (lbs/day)	0.820	2.915	1/Year	Grab
4-Nitrophenol (lbs/day)	2.044	7.268	1/Year	Grab
Phenanthrene (lbs/day)	0.240	0.593	1/Month	Grab
Phenol (lbs/day)	0.240	0.593	1/Year	Grab
Pyrene (lbs/day)	0.252	0.606	1/Month	Grab
Tetrachloroethylene (lbs/day)	0.656	2.069	1/Month	Grab
Toluene (lbs/day)	0.353	0.934	1/Month	Grab
Total Chromium (lbs/day)	14.006	34.951	1/Month	24-hr Composite
Total Copper (lbs/day)	18.296	42.648	1/Month	24-hr Composite
Total Cyanide (lbs/day)	5.299	15.141	1/Year	Grab
Total Lead (lbs/day)	4.038	8.706	1/Year	24-hr Composite
Total Nickel (lbs/day)	21.324	50.218	1/Year	24-hr Composite
Total Zinc (lbs/day)	13.249	32.932	1/Month	24-hr Composite
1,2,4-Trichlorobenzene (lbs/day)	2.473	10.018	1/Year	Grab

A5. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS - continued

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	Monthly Avg.	Daily Max.	Measurement Frequency	Sample Type
1,1,1-Trichloroethane (lbs/day)	0.278	0.744	1/Year	Grab
1,1,2-Trichloroethane (lbs/day)	0.404	1.602	1/Month	Grab
Trichloroethylene (lbs/day)	0.328	0.871	1/Year	Grab
Vinyl Chloride (lbs/day)	1.224	2.170	1/Month	Grab

The pH of the effluent shall not be less than 6.0 standard units or greater than 9.0 standard units and shall be monitored 1/Week by grab sample.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: nearest accessible point after final treatment, but prior to actual discharge to or mixing with the receiving waters or wastestreams from other outfalls.

There shall be no discharge of floating solids or visible foam or sheen in other than trace amounts.

The abbreviation BOD_5 means Biochemical Oxygen Demand (5-day).

B. Schedule of Compliance

The permittee shall comply with the effluent limitations and permit conditions by the effective date of the permit.

C. Cooling Water Additives, FIFRA, and Mollusk Control

The discharge of any product registered under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) in cooling water which ultimately may be released to the waters of the Commonwealth is prohibited, except Herbicides, unless specifically identified and authorized by the KPDES permit. In the event the permittee needs to use a biocide or chemical, not previously reported, for mollusk control or other purpose the permittee shall submit sufficient information, a minimum of thirty (30) days prior to the commencement of use of said biocides or chemicals, to the Division of Water for review and establishment of appropriate control parameters. Such information requirements shall include:

1. Name and general composition of biocide or chemical,
2. Any and all aquatic organism toxicity data,
3. Quantities to be used,
4. Frequencies of use,
5. Proposed discharge concentrations, and
6. EPA registration number, if applicable.

D. Rainfall and Storm Water Runoff Monitoring Requirements

The permittee shall maintain daily records of rainfall at the plant site. Samples shall be taken as soon as practicable upon commencement of discharge.

STANDARD CONDITIONS FOR KPDES PERMIT

This permit has been issued under the provisions of KRS Chapter 224 and regulations promulgated pursuant thereto. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits or licenses required by this Cabinet and other state, federal, and local agencies.

It is the responsibility of the permittee to demonstrate compliance with permit parameter limitations by utilization of sufficiently sensitive analytical methods.

The permittee is also advised that all KPDES permit conditions in KPDES Regulation 401 KAR 5:065, Section 1 will apply to all discharges authorized by this permit.

PART III

OTHER REQUIREMENTS

A. Reporting of Monitoring Results

Monitoring results obtained during each monitoring period must be reported on a preprinted Discharge Monitoring Report (DMR) Form that will be mailed to you. The completed DMR for each monitoring period must be sent to the Division of Water at the address listed below (with a copy to the appropriate Regional Office) postmarked no later than the 28th day of the month following the monitoring period for which monitoring results were obtained.

Division of Water
Paducah Regional Office
130 Eagle Nest Drive
Paducah, Kentucky 42003
ATTN: Supervisor

Energy and Environment Cabinet
Dept. for Environmental Protection
Division of Water/Surface Water Permits Branch
200 Fair Oaks Lane
Frankfort, Kentucky 40601

B. Reopener Clause

This permit shall be modified, or alternatively revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under 401 KAR 5:050 through 5:085, if the effluent standard or limitation so issued or approved:

1. Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

2. Controls any pollutant not limited in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of KRS Chapter 224 when applicable.

C. Outfall Signage

The permittee shall post a permanent marker at all discharge locations and/or monitoring points. The marker shall be at least 2 feet by 2 feet in size and a minimum of 3 feet above ground level with the Permittee Name and KPDES permit and outfall numbers in 2 inch letters. For internal monitoring points the marker shall be of sufficient size to include the outfall number in 2 inch letters and shall be posted as near as possible to the actual sampling location.

D Mixing Zone

The assigned mixing zones for the discharge at Outfall 001 shall have the following dimensions:

Temperature:

Linear Distance from Point of Discharge:	0.045 feet in any direction
Maximum Surface Area Involved:	0.0016 square feet
Volume of Receiving Water	500 cfs (323 MGD)

Chloride, Total Residual Chlorine, 1,2-Dichloroethane, 1,1,2-Trichlorethane, Total Recoverable Copper, Total Recoverable Mercury, and Hexachlorobenzene:

Linear Distance from Point of Discharge:	86.1 feet in any direction
Maximum Surface Area Involved:	5,829 square feet
Volume of Receiving Water	500 cfs (323 MGD)

PART IV
ACUTE CONCERNS
Biomonitoring

In accordance with PART I of this permit, the permittee shall initiate, within 30 days of the effective date of this permit, or continue the series of tests described below to evaluate wastewater toxicity of the discharge from Outfall 001.

TEST REQUIREMENTS

The permittee shall perform a 48-hour static non-renewal toxicity test with water flea (Ceriodaphnia dubia) and a 48-hour static non-renewal toxicity test with fathead minnow (Pimephales promelas). Tests shall be conducted on each of two grab samples taken over a 24-hour period approximately 12 hours apart (e.g. discrete sample #1 taken at 9:00 a.m., sample #2 taken at 9:00 p.m.). In addition to use of a control, effluent concentrations for the tests must include the permitted limit, (i.e., 25% effluent) and at least four additional effluent concentrations. For a permit limit of 100% effluent, test concentrations shall be 20%, 40%, 60%, 80% and 100%. If the permit limit is less than 100% effluent and greater than or equal to 75% effluent, the test concentrations shall include the permitted limit, two concentrations below the limit that are based on a 0.5 dilution factor, and two concentrations above the limit (to include 100% and mid-point between the permit limit and 100%). If the permit limit is less than 75% effluent, test concentrations shall include the permit limit concentration, two concentrations below the limit based on a 0.5 dilution factor, and two concentrations above the limit based on a 0.5 dilution factor if possible, otherwise to include 100% and mid-point between the permit limit and 100% . Selection of different effluent concentrations must be approved by the Division prior to testing. Testing of the effluent shall be initiated within 36 hours of each sample collection. Controls shall be conducted concurrently with effluent testing using synthetic water. The analysis will be deemed reasonable and good only if control survival is 90% or greater in test organisms held in synthetic water. Any test that does not meet the control acceptability criteria shall be repeated as soon as practicable within the monitoring period (i.e. monthly or quarterly). Noncompliance with the toxicity limit will be demonstrated if the LC_{50} is less than **25**% effluent.

Tests shall be conducted on both species at the frequency specified in PART I of this permit.

If after at least six consecutive toxicity tests it can be determined that Ceriodaphnia dubia or the fathead minnow is more sensitive and all tests have passed, a request for testing with only the most sensitive species can be submitted to the Division. Upon approval, that most sensitive species may be considered as representative and all subsequent compliance tests can be conducted using only that species unless directed at any time by the Division to change or revert to both.

REPORTING REQUIREMENTS

Results of all toxicity tests conducted with any species shall be reported according to the most recent format provided by the Division of Water. Notification of failed test shall be made to the Division's Water Quality Branch within five days of test completion. Failed test reports shall be submitted to the Division's Water Quality Branch within thirty (30) days of completion.

PART IV – BIOMONITORING - ACUTE CONCERNS

ACUTE TOXICITY

If noncompliance with the toxicity limit occurs in an initial test, (i.e., the LC_{50} for either species in either grab sample is less than 25% effluent), the permittee must repeat the test using new grab samples collected approximately 12 hours apart. Sampling must be initiated within 10 days of completing the failed test. The second round of testing shall include both species unless approved for only the most sensitive species by the Division. Results of the second round of testing will be used to evaluate the persistence of the toxic event and the possible need for a Toxicity Reduction Evaluation (TRE).

If the second round of testing also demonstrates noncompliance with the toxicity limit, the permittee will be required to perform accelerated testing as specified in the following paragraphs.

Complete four additional rounds of testing to evaluate the frequency and degree of toxicity within 60 days of completing the second failed round of testing. Results of the initial and second rounds of testing specified above plus the four additional rounds of testing will be used in deciding if a TRE shall be required.

If results from any two of six rounds of testing show a significant noncompliance with the acute limit, (i.e., $\geq$1.2 times the TU_a), or results from any four of the six tests show acute toxicity (as defined in 1.A), a TRE will be required.

The permittee shall provide written notification to the Division of Water within five (5) days of completing the accelerated testing, stating that: (1) toxicity persisted and that a TRE will be initiated; or (2) that toxicity did not persist and normal testing will resume.

Should toxicity prove not to be persistent during the accelerated testing period, but reoccur within 12 months of the initial failure at a level • 1.2 times the TU_a, then a TRE shall be required.

TOXICITY REDUCTION EVALUATION (TRE)

Having determined that a TRE is required, the permittee shall initiate and/or continue at least monthly testing with both species until such time as a specific TRE plan is approved by the Division. A TRE plan shall be developed by the permittee and submitted to the Division within thirty days of determining a TRE is required. The plan shall be developed in accordance with the most recent EPA and Division guidance. Questions regarding this process may be submitted to the Division's Water Quality Branch.

The TRE plan shall include Toxic Identification Evaluation (TIE) procedures, treatability studies, and evaluations of: chemical usage including changes in types, handling and suppliers; operational and process procedures; housekeeping and maintenance activities; and raw materials. The TRE plan will establish an implementation schedule to begin immediately upon approval by the Division, to have duration of at least six months, and not to exceed 24 months. The implementation schedule shall include quarterly progress reports being submitted to the Division's Water Quality Branch, due the last day of the month following each calendar quarter.

PART IV – BIOMONITORING - ACUTE CONCERNS

TOXICITY REDUCTION EVALUATION (TRE)

Upon completion of the TRE, the permittee shall submit a final report detailing the findings of the TRE and actions taken or to be taken to prevent the reoccurrence of toxicity. This final report shall include: the toxicant(s), if any are identified; treatment options; operational changes; and the proposed resolutions including an implementation schedule not to exceed 180 days.

Should the permittee determine the toxicant(s) and/or a workable treatment prior to the planned conclusion of the TRE, the permittee will notify the Division's Water Quality Branch within five days of making that determination and take appropriate actions to implement the solution within 180 days of that notification.

TEST METHODS

All test organisms, procedures, and quality assurance criteria used shall be in accordance with Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, EPA-821-R-02-012 (5th edition), the most recently published edition of this publication, or as approved in advance by the Division of Water.

Toxicity testing for compliance to KPDES discharge limits shall be performed by a laboratory approved by the Division of Water to conduct the required toxicity tests. Within each toxicity report to the Division, the permittee must demonstrate successful performance of reference toxicant testing by the laboratory that conducts their effluent toxicity tests. Within 30 days prior to initiating an effluent toxicity test, a reference toxicant test must be completed for the method used; alternatively, the reference toxicant test may be run concurrent with the effluent toxicity test. In addition, for each test method, at least 5 acceptable reference toxicant tests must be completed by the laboratory prior to performing the effluent toxicity test. A control chart including the most recent reference toxicant test endpoints for the effluent test method (minimum of 5, up to 20 if available) shall be part of the report.

PART V
BEST MANAGEMENT PRACTICES

SECTION A. GENERAL CONDITIONS

1. Applicability

These conditions apply to all permittees who use, manufacture, store, handle or discharge any pollutant listed as toxic under Section 307(a)(1) of the Clean Water Act, oil, as defined in Section 311(a)(1) of the Act, and any pollutant listed as hazardous under Section 311 of the Act and who have ancillary manufacturing operations which could result in (1) the release of a hazardous substance, pollutant, or contaminant in a reportable quantity, or (2) an environmental emergency, as defined in KRS 224.01-400, as amended, or any regulation promulgated pursuant thereto (hereinafter, the "BMP pollutants"). These operations include material storage areas; plant site runoff; in-plant transfer, process and material handling areas; loading and unloading operations, and sludge and waste disposal areas.

2. BMP Plan

The permittee shall develop and implement a Best Management Practices (BMP) plan consistent with 401 KAR 5:065, Section 2(10) pursuant to KRS 224.70-110, which prevents, or minimizes the potential for, the release of "BMP pollutants" from ancillary activities through plant site runoff; spillage or leaks, sludge or waste disposal; or drainage from raw material storage. A Best Management Practices (BMP) plan will be prepared by the permittee unless the permittee can demonstrate through the submission of a BMP outline that the elements and intent of the BMP have been fulfilled through the use of existing plans such as the Spill Prevention Control and Countermeasure (SPCC) plans, contingency plans, and other applicable documents.

3. Implementation

The plan shall be modified to implement the requirements of Section B - Specific Conditions as soon as possible but not later than one (1) year from the effective date of the permit.

4. General Requirements

The BMP plan shall:

a. Be documented in narrative form, and shall include any necessary plot plans, drawings or maps.

b. Establish specific objectives for the control of toxic and hazardous pollutants.

(1) Each facility component or system shall be examined for its potential for causing a release of "BMP pollutants" due to equipment failure, improper operation, natural phenomena such as rain or snowfall, etc.

(2) Where experience indicates a reasonable potential for equipment failure (e.g., a tank overflow or leakage), natural condition (e.g., precipitation), or other circumstances which could result in a release of "BMP pollutants", the plan should include a prediction of the direction, rate of flow and total quantity of the pollutants which could be released from the facility as result of each condition or circumstance.

c. Establish specific best management practices to meet the objectives identified under Paragraph b of this section, addressing each component or system capable of causing a release of "BMP pollutants."

d. Include any special conditions established in part B of this section.

e. Be reviewed by plant engineering staff and the plant manager.

5. Specific Requirements

The plan shall be consistent with the general guidance contained in the publication entitled "NPDES Best Management Practices Guidance Document" and shall include the following baseline BMP's as a minimum.

a. BMP Committee
b. Reporting of BMP Incidents
c. Risk Identification and Assessment
d. Employee Training
e. Inspections and Records
f. Preventive Maintenance
g. Good Housekeeping
h. Materials Compatibility
i. Security
j. Materials Inventory

6. SPCC Plans

The BMP plan may reflect requirements for Spill Prevention Control and Countermeasure (SPCC) plans under Section 311 of the Act and 40 CFR Part 151, and may incorporate any part of such plans into the BMP plan by reference.

7. Hazardous Waste Management

The permittee shall assure the proper management of solids and hazardous waste in accordance with the regulations promulgated under the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1978 (RCRA) (40 U.S.C. 6901 et seq.) Management practices required under RCRA regulations shall be referenced in the BMP plan.

8. Documentation

The permittee shall maintain a description of the BMP plan at the facility and shall make the plan available to the Director within one (1) year after the effective date of the permit. Copies of the BMP plan shall be sent to:

Division of Water
Paducah Regional Office
130 Eagle Nest Drive
Paducah, Kentucky 42003
ATTN: Supervisor

Energy & Environment Cabinet
Dept. for Environmental Protection
Division of Water/Surface Water Permits Branch
200 Fair Oaks Lane
Frankfort, Kentucky 40601

9. BMP Plan Modification

The permittee shall amend the BMP plan whenever there is a change in the facility or change in the operation of the facility which materially increases the potential for the ancillary activities to result in the release of "BMP pollutants."

10. Modification for Ineffectiveness

If the BMP plan proves to be ineffective in achieving the general objective of preventing the release of "BMP pollutants" then the specific objectives and requirements under Paragraphs b and c of Section 4, the permit and/or the BMP plan shall be subject to modification to incorporate revised BMP requirements. If at any time following the issuance of this permit, the BMP plan is found to be inadequate pursuant to a state or federal site inspection or plan review, the plan shall be modified to incorporate such changes necessary to resolve the concerns.

SECTION B. SPECIFIC CONDITIONS

ATTACHMENT A
CORMIX Diffuser Model – Thermal

CORMIX2 PREDICTION FILE:

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------------------------------------------------------------------------------
                      CORMIX MIXING ZONE EXPERT SYSTEM
         Subsystem CORMIX2:  Multiport Diffuser Discharges
                          CORMIX Version 5.0GT
                       HYDRO2 Version 5.0.0.0 March 2007
------------------------------------------------------------------------------
------------------------------------------------------------------------------
CASE DESCRIPTION
 Site name/label:   001
 Design case:       Temperature Mixing Zone
 FILE NAME:         C:\...CORMIX 5.0_TEST\MyFiles\Westlake Vinyls trial.prd
 Time stamp:        Tue Mar 17 10:45:50 2009

ENVIRONMENT PARAMETERS (metric units)
 Bounded section
 BS    =    365.70  AS    =   1279.95  QA    =    140.43  ICHREG= 1
 HA    =      3.50  HD    =      3.50
 UA    =     0.110 F     =     0.063 USTAR =0.9736E-02
 UW    =     2.000 UWSTAR=0.2198E-02
 Uniform density environment
 STRCND=  U         RHOAM =  998.4062

DIFFUSER DISCHARGE PARAMETERS (metric units)
 Diffuser type:     DITYPE= alternating_perpendicular
 BANK  =  LEFT      DISTB =     10.06  YB1   =      3.66  YB2   =     16.46
 LD    =     12.80  NOPEN =    8       SPAC  =      1.83
 D0    =     0.076 A0    =     0.005 H0    =      0.00  SUB0  =      3.50
 Nozzle/port arrangement:   near_vertical_discharge
 GAMMA =     90.00  THETA =     90.00  SIGMA =      0.00  BETA  =     90.00
 U0    =     5.128 Q0    =     0.187       =0.1871E+00
 RHO0  =  998.4453  DRHO0 =-.3900E-01  GP0   =-.3831E-03
 C0    =0.1880E+02  CUNITS=  deg.C
 IPOLL =  3         KS    =0.0000E+00  KD    =0.0000E+00

FLUX VARIABLES - PER UNIT DIFFUSER LENGTH (metric units)
 q0    =0.1461E-01  m0    =0.7494E-01  j0    =-.5598E-05  SIGNJ0=     -1.0
 Associated 2-d length scales (meters)
 lQ=B  =     0.003 lM    =    236.59  lm    =      6.23
 lmp   =  99999.00  lbp   =  99999.00  la    =  99999.00

FLUX VARIABLES - ENTIRE DIFFUSER (metric units)
 Q0    =0.1871E+00  M0    =0.9593E+00  J0    =-.7167E-04
 Associated 3-d length scales (meters)
 LQ    =     0.07  LM    =    114.57  Lm    =      8.93  Lb    =      0.05
                                      Lmp   =  99999.00  Lbp   =  99999.00

NON-DIMENSIONAL PARAMETERS
 FR0   =   4910.83  FRD0  =    949.71  R     =     46.74  PL    =    140.
 (slot)             (port/nozzle)
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FLOW CLASSIFICATION
 2222222222222222222222222222222222222222
 2  Flow class (CORMIX2)      =    MNU13  2
 2  Applicable layer depth HS =     3.50  2
 2222222222222222222222222222222222222222

MIXING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS
 C0    =0.1880E+02  CUNITS=  deg.C
 NTOX  =  0
 NSTD  =  1         CSTD  =0.1270E+02
 REGMZ =  0
 XINT  =   3657.00  XMAX  =   3657.00

X-Y-Z COORDINATE SYSTEM:
    ORIGIN is located at the bottom and the diffuser mid-point:
        10.06 m  from the LEFT  bank/shore.
    X-axis points downstream, Y-axis points to left, Z-axis points upward.
NSTEP = 800 display intervals per module

NOTE on dilution/concentration values for this HEATED DISCHARGE (IPOLL=3):
   S  = hydrodynamic dilutions, include buoyancy (heat) loss effects, but
        provided plume has surface contact
   C  = corresponding temperature values (always in "degC"!),
        include heat loss, if any
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
BEGIN MOD201: DIFFUSER DISCHARGE MODULE

 Due to complex near-field motions:  EQUIVALENT SLOT DIFFUSER (2-D) GEOMETRY

 Profile definitions:
   BV = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
   BH = top-hat half-width, in horizontal plane normal to trajectory
   S  = hydrodynamic centerline dilution
   C  = centerline concentration (includes reaction effects, if any)

       X        Y        Z        S       C       BV       BH
      0.00     0.00    0.00     1.0 0.188E+02   0.00     6.40

END OF MOD201: DIFFUSER DISCHARGE MODULE
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
BEGIN MOD277: UNSTABLE NEAR-FIELD ZONE OF ALTERNATING PERPENDICULAR DIFFUSER

 Because of the strong ambient current the diffuser plume of this crossflowing
   discharge gets RAPIDLY DEFLECTED.
 A near-field zone is formed that is VERTICALLY FULLY MIXED over the entire
   layer depth.  Full mixing is achieved at a downstream distance of about
   five (5) layer depths.

 Profile definitions:
   BV = layer depth (vertically mixed)
   BH = top-hat half-width, measured horizontally in Y-direction
   S  = hydrodynamic average (bulk) dilution
   C  = average (bulk) concentration (includes reaction effects, if any)
```

```
       X        Y       Z        S       C       BV       BH
     0.00     0.00    0.00     1.0 0.188E+02   0.00     6.40
** WATER QUALITY STANDARD OR CCC HAS BEEN FOUND **
 The pollutant concentration in the plume falls below water quality standard
   or CCC value of 0.127E+02 in the current prediction interval.
 This is the spatial extent of concentrations exceeding the water quality
   standard or CCC value.
     0.02     0.00    0.00     1.9 0.991E+01   0.01     6.40
     0.04     0.00    0.00     2.3 0.829E+01   0.01     6.40
     0.07     0.00    0.00     2.6 0.736E+01   0.02     6.40
     0.09     0.00    0.00     2.8 0.673E+01   0.02     6.40
.
.
.
    17.43     0.00    0.00    26.3 0.714E+00   3.49     6.42
    17.46     0.00    0.00    26.3 0.714E+00   3.49     6.42
    17.48     0.00    0.00    26.3 0.714E+00   3.50     6.42
    17.50     0.00    0.00    26.4 0.713E+00   3.50     6.42
 Cumulative travel time =         317.9636 sec
   Plume centerline may exhibit slight discontinuities in transition
     to subsequent far-field module.

END OF MOD277: UNSTABLE NEAR-FIELD ZONE OF ALTERNATING PERPENDICULAR DIFFUSER
-------------------------------------------------------------------------------
** End of NEAR-FIELD REGION (NFR) **
-------------------------------------------------------------------------------
BEGIN MOD241: BUOYANT AMBIENT SPREADING

 Discharge is non-buoyant or weakly buoyant.
   Therefore BUOYANT SPREADING REGIME is ABSENT.

END OF MOD241: BUOYANT AMBIENT SPREADING
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
BEGIN MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

  Vertical diffusivity (initial value)   = 0.684E-02 m^2/s
  Horizontal diffusivity (initial value) = 0.856E-02 m^2/s

 The passive diffusion plume is VERTICALLY FULLY MIXED at beginning of region.

 Profile definitions:
   BV = Gaussian s.d.*sqrt(pi/2) (46%) thickness, measured vertically
      = or equal to layer depth, if fully mixed
   BH = Gaussian s.d.*sqrt(pi/2) (46%) half-width,
        measured horizontally in Y-direction
   ZU = upper plume boundary (Z-coordinate)
   ZL = lower plume boundary (Z-coordinate)
   S  = hydrodynamic centerline dilution
   C  = centerline concentration (includes reaction effects, if any)
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Plume Stage 1 (not bank attached):

X	Y	Z	S	C	BV	BH	ZU	ZL
17.50	0.00	0.00	26.4	0.713E+00	3.50	6.42	3.50	0.00
17.81	0.00	0.00	26.4	0.712E+00	3.50	6.43	3.50	0.00
18.11	0.00	0.00	26.4	0.712E+00	3.50	6.43	3.50	0.00
18.42	0.00	0.00	26.4	0.711E+00	3.50	6.44	3.50	0.00
.								
.								
.								
261.54	0.00	0.00	41.2	0.456E+00	3.50	10.05	3.50	0.00
261.85	0.00	0.00	41.3	0.456E+00	3.50	10.05	3.50	0.00
262.15	0.00	0.00	41.3	0.455E+00	3.50	10.05	3.50	0.00
262.46	0.00	0.00	41.3	0.455E+00	3.50	10.06	3.50	0.00

Cumulative travel time = 2547.6824 sec

Plume Stage 2 (bank attached):

X	Y	Z	S	C	BV	BH	ZU	ZL
262.46	10.06	0.00	41.3	0.455E+00	3.50	20.12	3.50	0.00
266.70	10.06	0.00	41.3	0.455E+00	3.50	20.14	3.50	0.00
270.95	10.06	0.00	41.4	0.454E+00	3.50	20.17	3.50	0.00
275.19	10.06	0.00	41.5	0.454E+00	3.50	20.19	3.50	0.00
.								
.								
.								
3644.26	10.06	0.00	72.0	0.261E+00	3.50	35.10	3.50	0.00
3648.50	10.06	0.00	72.1	0.261E+00	3.50	35.12	3.50	0.00
3652.75	10.06	0.00	72.1	0.261E+00	3.50	35.13	3.50	0.00
3656.99	10.06	0.00	72.1	0.261E+00	3.50	35.15	3.50	0.00

Cumulative travel time = 33446.0742 sec

Simulation limit based on maximum specified distance = 3657.00 m.
This is the REGION OF INTEREST limitation.

END OF MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

CORMIX2: Multiport Diffuser Discharges End of Prediction File
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CORMIX SESSION REPORT:

```
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                      CORMIX MIXING ZONE EXPERT SYSTEM
                          CORMIX Version 5.0GT
                       HYDRO2:Version  March,2007
SITE NAME/LABEL:                 001
  DESIGN CASE:                   Temperature Mixing Zone
  FILE NAME:                     C:\Program Files\CORMIX 5.0 TEST\MyFiles\Westlake
Vinyls trial.prd
  Using subsystem CORMIX2:     Multiport Diffuser Discharges
  Start of session:              03/17/2009--10:45:50
*******************************************************************************
SUMMARY OF INPUT DATA:
-------------------------------------------------------------------------------
AMBIENT PARAMETERS:
  Cross-section                          = bounded
  Width                          BS      = 365.70 m
  Channel regularity             ICHREG = 1
  Ambient flowrate               QA      = 140.43 m^3/s
  Average depth                  HA      = 3.5 m
  Depth at discharge             HD      = 3.5 m
  Ambient velocity               UA      = 0.1097 m/s
  Darcy-Weisbach friction factor F       = 0.063
  Wind velocity                  UW      = 2 m/s
  Stratification Type            STRCND = U
  Surface temperature                    = 19 degC
  Bottom temperature                     = 19 degC
  Calculated FRESH-WATER DENSITY values:
  Surface density                RHOAS   = 998.4063 kg/m^3
  Bottom density                 RHOAB   = 998.4063 kg/m^3
-------------------------------------------------------------------------------
DISCHARGE PARAMETERS:            Submerged Multiport Diffuser Discharge
  Diffuser type                  DITYPE = alternating perpendicular
  Diffuser length                LD      = 12.80 m
  Nearest bank                           = left
  Diffuser endpoints             YB1     = 3.66 m;    YB2 = 16.46 m
  Number of openings             NOPEN   = 8
  Number of Risers               NRISER = 8
  Ports/Nozzles per Riser        NPPERR  = 1
  Spacing between risers/openings SPAC   = 1.83 m
  Port/Nozzle diameter           D0      = 0.0762 m
    with contraction ratio               = 1
  Equivalent slot width          B0      = 0.0028 m
  Total area of openings         TA0     = 0.0365 m^2
  Discharge velocity             U0      = 5.13 m/s
  Total discharge flowrate       Q0      = 0.18708 m^3/s
  Discharge port height          H0      = 0 m
  Nozzle arrangement             BETYPE = near vertical discharge
  Diffuser alignment angle       GAMMA   = 90 deg
  Vertical discharge angle       THETA   = 90 deg
  Actual Vertical discharge angle THEAC  = 90 deg
  Horizontal discharge angle     SIGMA   = 0 deg
  Relative orientation angle     BETA    = 90 deg
  Discharge temperature (freshwater)     = 18.80 degC
  Corresponding density          RHO0    = 998.4452 kg/m^3
  Density difference             DRHO    = -0.0390 kg/m^3
```

```
  Buoyant acceleration            GP0    = -0.0004 m/s^2
  Discharge concentration         C0     = 18.800000 deg.C
  Surface heat exchange coeff.    KS     = 0 m/s
  Coefficient of decay            KD     = 0 /s
-------------------------------------------------------------------------------
FLUX VARIABLES PER UNIT DIFFUSER LENGTH:
  Discharge (volume flux)         q0     = 0.014614 m^2/s
  Momentum flux                   m0     = 0.074938 m^3/s^2
  Buoyancy flux                   j0     = -0.000006 m^3/s^3
-------------------------------------------------------------------------------
DISCHARGE/ENVIRONMENT LENGTH SCALES:
  LQ  = 0.00 m         Lm  = 6.23 m         LM  = 236.59 m
  lm' = 99999 m         Lb' = 99999 m         La  = 99999 m
  (These refer to the actual discharge/environment length scales.)
-------------------------------------------------------------------------------
NON-DIMENSIONAL PARAMETERS:
Slot Froude number              FR0    = 4910.83
  Port/nozzle Froude number       FRD0   = 949.71
  Velocity ratio                  R      = 46.74
-------------------------------------------------------------------------------
MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:
  Toxic discharge                         = no
  Water quality standard specified        = yes
  Water quality standard          CSTD    = 12.700000 deg.C
  Regulatory mixing zone                  = no
  Region of interest                      = 3657 m downstream
*******************************************************************************
HYDRODYNAMIC CLASSIFICATION:
  *------------------------*
  | FLOW CLASS   = MNU13 |
  *------------------------*
  This flow configuration applies to a layer corresponding to the full water
  depth at the discharge site.
  Applicable layer depth = water depth = 3.5 m
*******************************************************************************
MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

-------------------------------------------------------------------------------
X-Y-Z Coordinate system:
  Origin is located at the bottom below the port center:
    10.06 m from the left bank/shore.
  Number of display steps NSTEP = 800 per module.
-------------------------------------------------------------------------------
NEAR-FIELD REGION (NFR) CONDITIONS :
Note: The NFR is the zone of strong initial mixing.  It has no regulatory
  implication.  However, this information may be useful for the discharge
  designer because the mixing in the NFR is usually sensitive to the
  discharge design conditions.
  Pollutant concentration at NFR edge  c = 0.7131 deg.C
  Dilution at edge of NFR              s = 26.4
  NFR Location:                        x = 17.50 m
    (centerline coordinates)           y = 0 m
                                       z = 0 m
  NFR plume dimensions:  half-width (bh) = 6.42 m
                          thickness (bv) = 3.5 m
Cumulative travel time:       317.9661 sec.
-------------------------------------------------------------------------------
```

```
Buoyancy assessment:
  The effluent density is greater than the surrounding ambient water
  density at the discharge level.
  Therefore, the effluent is NEGATIVELY BUOYANT and will tend to sink towards
  the bottom.
IMPORTANT NOTE:
Since the effluent is NEGATIVELY BUOYANT, it is STRONGLY recommended that you
consider using the Brine or Sediment options for Effluent specification for a more
detailed analysis.

CORMIX will however continue with the current simulation.
-------------------------------------------------------------------------------
Near-field instability behavior:
  The diffuser flow will experience instabilities with full vertical mixing
  in the near-field.
  There may be benthic impact of high pollutant concentrations.
-------------------------------------------------------------------------------
FAR-FIELD MIXING SUMMARY:
  Plume becomes vertically fully mixed ALREADY IN NEAR-FIELD at 17.50 m
  downstream and continues as vertically mixed into the far-field.
-------------------------------------------------------------------------------
PLUME BANK CONTACT SUMMARY:
  Plume in bounded section contacts one bank only at 262.46 m downstream.
************************ TOXIC DILUTION ZONE SUMMARY ************************
No TDZ was specified for this simulation.
*********************** REGULATORY MIXING ZONE SUMMARY ***********************
No RMZ has been specified.
However:
The ambient water quality standard was encountered at the following
  plume position:
  Water quality standard               = 12.700000  deg.C
  Corresponding dilution             s = 1.5
  Plume location:                    x = 0.02 m
    (centerline coordinates)         y = 0 m
                                     z = 0 m
  Plume dimensions:      half-width (bh) = 6.40 m
                          thickness (bv) = 0.01 m
```

ATTACHMENT B
CORMIX Diffuser Model – Chloride

CORMIX2 PREDICTION FILE:

```
------------------------------------------------------------------------------
                    CORMIX MIXING ZONE EXPERT SYSTEM
         Subsystem CORMIX2:  Multiport Diffuser Discharges
                       CORMIX Version 5.0GT
                    HYDRO2 Version 5.0.0.0 March 2007
------------------------------------------------------------------------------
------------------------------------------------------------------------------
CASE DESCRIPTION
 Site name/label:   001
 Design case:       Chloride Mixing Zone
 FILE NAME:         C:\...IX 5.0_TEST\MyFiles\Westlake Vinyls Chlorides.prd
 Time stamp:        Tue May 26 09:33:37 2009

ENVIRONMENT PARAMETERS (metric units)
 Bounded section
 BS    =    365.70  AS    =   1279.95  QA    =    140.43  ICHREG= 1
 HA    =      3.50  HD    =      3.50
 UA    =     0.110 F     =     0.063 USTAR =0.9736E-02
 UW    =     2.000 UWSTAR=0.2198E-02
 Uniform density environment
 STRCND=  U         RHOAM =  998.4062

DIFFUSER DISCHARGE PARAMETERS (metric units)
 Diffuser type:     DITYPE= alternating_perpendicular
 BANK  =  LEFT      DISTB =     10.06  YB1   =      3.66  YB2   =     16.46
 LD    =     12.80  NOPEN =     8      SPAC  =      1.83
 D0    =     0.076 A0    =     0.005 H0    =      0.00  SUB0  =      3.50
 Nozzle/port arrangement:   near_vertical_discharge
 GAMMA =     90.00  THETA =     90.00  SIGMA =      0.00  BETA  =     90.00
 U0    =     5.128 Q0    =     0.187       =0.1871E+00
 RHO0  =  993.0427  DRHO0 =0.5364E+01  GP0   =0.5268E-01
 C0    =0.6000E+04  CUNITS=  mg/l
 IPOLL =  1         KS    =0.0000E+00  KD    =0.0000E+00

FLUX VARIABLES - PER UNIT DIFFUSER LENGTH (metric units)
 q0    =0.1461E-01  m0    =0.7494E-01  j0    =0.7699E-03  SIGNJ0=      1.0
 Associated 2-d length scales (meters)
 lQ=B  =     0.003 lM    =      8.90  lm    =      6.23
 lmp   =  99999.00  lbp   =  99999.00  la    =  99999.00

FLUX VARIABLES - ENTIRE DIFFUSER (metric units)
 Q0    =0.1871E+00  M0    =0.9593E+00  J0    =0.9856E-02
 Associated 3-d length scales (meters)
 LQ    =     0.07  LM    =      9.76  Lm    =      8.93  Lb    =      7.46
                                      Lmp   =  99999.00  Lbp   =  99999.00

NON-DIMENSIONAL PARAMETERS
 FR0   =    418.50  FRD0  =     80.93  R     =     46.74  PL    =     11.
 (slot)             (port/nozzle)
```

```
FLOW CLASSIFICATION
 2222222222222222222222222222222222222222
 2  Flow class (CORMIX2)      =    MU8    2
 2  Applicable layer depth HS =     3.50  2
 2222222222222222222222222222222222222222

MIXING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS
 C0    =0.6000E+04  CUNITS=  mg/l
 NTOX  =  0
 NSTD  =  1         CSTD  =0.1200E+04
 REGMZ =  0
 XINT  =   3657.00  XMAX  =   3657.00

X-Y-Z COORDINATE SYSTEM:
    ORIGIN is located at the bottom and the diffuser mid-point:
        10.06 m  from the LEFT  bank/shore.
    X-axis points downstream, Y-axis points to left, Z-axis points upward.
NSTEP = 800 display intervals per module
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
BEGIN MOD201: DIFFUSER DISCHARGE MODULE

 Due to complex near-field motions:  EQUIVALENT SLOT DIFFUSER (2-D) GEOMETRY

 Profile definitions:
   BV = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
   BH = top-hat half-width, in horizontal plane normal to trajectory
   S  = hydrodynamic centerline dilution
   C  = centerline concentration (includes reaction effects, if any)

       X        Y       Z        S       C       BV       BH
    0.00     0.00    0.00     1.0 0.600E+04   0.00     6.40

END OF MOD201: DIFFUSER DISCHARGE MODULE
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
BEGIN MOD234: UNSTABLE RECIRCULATION REGION OVER LAYER DEPTH

 INITIAL LOCAL VERTICAL INSTABILITY REGION:
   Bulk dilution (S =  28.48) occurs in a limited region (horizontal extent
   =   26.25 m) surrounding the discharge location.

  Control volume inflow:
       X        Y       Z        S       C       BV       BH
    0.00     0.00    0.00     1.0 0.600E+04   0.00     6.40

  Control volume outflow:
       X        Y       Z        S       C       BV       BH
   26.25     0.00    1.75    28.5 0.211E+03   3.50    15.15

END OF MOD234: UNSTABLE RECIRCULATION REGION OVER LAYER DEPTH
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
BEGIN MOD234a: UPSTREAM SPREADING AFTER NEAR-FIELD INSTABILITY
```

UPSTREAM INTRUSION PROPERTIES:

Upstream intrusion length	=	0.75 m
X-position of upstream stagnation point	=	25.50 m
Thickness in intrusion region	=	3.50 m
Half-width at downstream end	=	8.66 m
Thickness at downstream end	=	2.97 m

Control volume inflow:

X	Y	Z	S	C	BV	BH
26.25	0.00	1.75	28.5	0.211E+03	3.50	15.15

** WATER QUALITY STANDARD OR CCC HAS BEEN FOUND **
The pollutant concentration in the plume falls below water quality standard or CCC value of 0.120E+04 due to mixing in this control volume.
The actual extent of the zone at whose boundary the water quality standard or the CCC is exceeded will be smaller than the control volume outflow values predicted below.

Profile definitions:
BV = top-hat thickness, measured vertically
BH = top-hat half-width, measured horizontally in y-direction
ZU = upper plume boundary (Z-coordinate)
ZL = lower plume boundary (Z-coordinate)
S = hydrodynamic average (bulk) dilution
C = average (bulk) concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH	ZU	ZL
25.50	0.00	3.50	9999.9	0.000E+00	0.00	0.00	3.50	3.50
25.60	0.00	3.50	62.0	0.968E+02	3.50	5.58	3.50	0.00
26.10	0.00	3.50	29.2	0.205E+03	3.50	13.55	3.50	0.00
26.60	0.00	3.50	28.5	0.210E+03	3.50	12.13	3.50	0.00
27.10	0.00	3.50	28.7	0.209E+03	3.50	11.51	3.50	0.00
27.59	0.00	3.50	29.0	0.207E+03	3.50	10.98	3.50	0.00
28.09	0.00	3.50	29.3	0.205E+03	3.50	10.51	3.50	0.00
28.59	0.00	3.50	29.6	0.203E+03	3.50	10.09	3.50	0.00
29.09	0.00	3.50	29.8	0.201E+03	3.50	9.69	3.50	0.00
29.58	0.00	3.50	30.0	0.200E+03	3.50	9.33	3.50	0.00
30.08	0.00	3.50	30.0	0.200E+03	3.44	8.98	3.50	0.06
30.58	0.00	3.50	30.1	0.199E+03	2.97	8.66	3.50	0.53

Cumulative travel time = 39.4467 sec

END OF MOD234a: UPSTREAM SPREADING AFTER NEAR-FIELD INSTABILITY

** End of NEAR-FIELD REGION (NFR) **

BEGIN MOD241: BUOYANT AMBIENT SPREADING

Profile definitions:
BV = top-hat thickness, measured vertically
BH = top-hat half-width, measured horizontally in y-direction
ZU = upper plume boundary (Z-coordinate)
ZL = lower plume boundary (Z-coordinate)
S = hydrodynamic average (bulk) dilution
C = average (bulk) concentration (includes reaction effects, if any)

```
Plume Stage 1 (not bank attached):
       X        Y       Z        S       C        BV       BH      ZU      ZL
     30.58     0.00    3.50    30.1 0.199E+03   2.97     8.66    3.50    0.53
     30.58     0.00    3.50    30.1 0.199E+03   2.97     8.66    3.50    0.53
     30.59     0.00    3.50    30.1 0.199E+03   2.97     8.66    3.50    0.53
     30.59     0.00    3.50    30.1 0.199E+03   2.96     8.66    3.50    0.54
.
.
.
33.72     0.00    3.50    31.3 0.192E+03   2.65    10.06    3.50    0.85
     33.72     0.00    3.50    31.3 0.192E+03   2.65    10.06    3.50    0.85
     33.73     0.00    3.50    31.3 0.192E+03   2.65    10.06    3.50    0.85
 Cumulative travel time =          68.1201 sec

--------------------------------------------------------------------------------
 Plume is ATTACHED to LEFT  bank/shore.
   Plume width is now determined from LEFT  bank/shore.

 Plume Stage 2 (bank attached):
       X        Y       Z        S       C        BV       BH      ZU      ZL
     33.73    10.06    3.50    31.3 0.192E+03   2.65    20.12    3.50    0.85
     35.32    10.06    3.50    31.6 0.190E+03   2.59    20.80    3.50    0.91
     36.91    10.06    3.50    31.8 0.189E+03   2.53    21.46    3.50    0.97
.
.
.
1303.85    10.06    3.50   495.0 0.121E+02   3.50   238.13    3.50    0.00
   1305.45    10.06    3.50   496.2 0.121E+02   3.50   238.32    3.50    0.00
   1307.04    10.06    3.50   497.5 0.121E+02   3.50   238.52    3.50    0.00
 Cumulative travel time =      11658.3076 sec

END OF MOD241: BUOYANT AMBIENT SPREADING
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
BEGIN MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

  Vertical diffusivity (initial value)   = 0.684E-02 m^2/s
  Horizontal diffusivity (initial value) = 0.856E-02 m^2/s

 The passive diffusion plume is VERTICALLY FULLY MIXED at beginning of region.

 Profile definitions:
   BV = Gaussian s.d.*sqrt(pi/2) (46%) thickness, measured vertically
      = or equal to layer depth, if fully mixed
   BH = Gaussian s.d.*sqrt(pi/2) (46%) half-width,
        measured horizontally in Y-direction
   ZU = upper plume boundary (Z-coordinate)
   ZL = lower plume boundary (Z-coordinate)
   S  = hydrodynamic centerline dilution
   C  = centerline concentration (includes reaction effects, if any)

 Plume Stage 2 (bank attached):
       X        Y       Z        S       C        BV       BH      ZU      ZL
   1307.04    10.06    3.50   497.5 0.121E+02   3.50   238.52    3.50    0.00
   1309.98    10.06    3.50   497.5 0.121E+02   3.50   238.52    3.50    0.00
   1312.91    10.06    3.50   497.5 0.121E+02   3.50   238.52    3.50    0.00
```

```
.
.
.
3651.16    10.06    3.50   500.0 0.120E+02   3.50   239.72    3.50    0.00
   3654.10    10.06    3.50   500.0 0.120E+02   3.50   239.72    3.50    0.00
   3657.04    10.06    3.50   500.0 0.120E+02   3.50   239.72    3.50    0.00
 Cumulative travel time =       33048.5156 sec

 Simulation limit based on maximum specified distance =   3657.00 m.
   This is the REGION OF INTEREST limitation.

END OF MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
CORMIX2: Multiport Diffuser Discharges       End of Prediction File
2222222222222222222222222222222222222222222222222222222222222222222222222222
```

CORMIX SESSION REPORT:

```
CORMIX SESSION REPORT:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                     CORMIX MIXING ZONE EXPERT SYSTEM
                         CORMIX Version 5.0GT
                      HYDRO2:Version March,2007
SITE NAME/LABEL:                 001
  DESIGN CASE:                   Chloride Mixing Zone
  FILE NAME:                     C:\Program Files\CORMIX 5.0 TEST\MyFiles\Westlake
Vinyls Chlorides.prd
  Using subsystem CORMIX2:     Multiport Diffuser Discharges
  Start of session:             05/26/2009--09:33:36
*******************************************************************************
SUMMARY OF INPUT DATA:
-------------------------------------------------------------------------------
AMBIENT PARAMETERS:
  Cross-section                          = bounded
  Width                          BS      = 365.70 m
  Channel regularity             ICHREG  = 1
  Ambient flowrate               QA      = 140.43 m^3/s
  Average depth                  HA      = 3.5 m
  Depth at discharge             HD      = 3.5 m
  Ambient velocity               UA      = 0.1097 m/s
  Darcy-Weisbach friction factor F       = 0.063
  Wind velocity                  UW      = 2 m/s
  Stratification Type            STRCND  = U
  Surface temperature                    = 19 degC
  Bottom temperature                     = 19 degC
  Calculated FRESH-WATER DENSITY values:
  Surface density                RHOAS   = 998.4063 kg/m^3
  Bottom density                 RHOAB   = 998.4063 kg/m^3
-------------------------------------------------------------------------------
DISCHARGE PARAMETERS:            Submerged Multiport Diffuser Discharge
  Diffuser type                  DITYPE  = alternating perpendicular
  Diffuser length                LD      = 12.80 m
  Nearest bank                           = left
  Diffuser endpoints             YB1     = 3.66 m;    YB2 = 16.46 m
```

```
  Number of openings              NOPEN  = 8
  Number of Risers                NRISER = 8
  Ports/Nozzles per Riser         NPPERR  = 1
  Spacing between risers/openings SPAC   = 1.83 m
  Port/Nozzle diameter            D0     = 0.0762 m
    with contraction ratio                = 1
  Equivalent slot width           B0     = 0.0028 m
  Total area of openings          TA0    = 0.0365 m^2
  Discharge velocity              U0     = 5.13 m/s
  Total discharge flowrate        Q0     = 0.18708 m^3/s
  Discharge port height           H0     = 0 m
  Nozzle arrangement              BETYPE = near vertical discharge
  Diffuser alignment angle        GAMMA  = 90 deg
  Vertical discharge angle        THETA  = 90 deg
  Actual Vertical discharge angle THEAC  = 90 deg
  Horizontal discharge angle      SIGMA  = 0 deg
  Relative orientation angle      BETA   = 90 deg
  Discharge temperature (freshwater)     = 37.78 degC
  Corresponding density           RHO0   = 993.0427 kg/m^3
  Density difference              DRHO   = 5.3635 kg/m^3
  Buoyant acceleration            GP0    = 0.0527 m/s^2
  Discharge concentration         C0     = 6000 mg/l
  Surface heat exchange coeff.    KS     = 0 m/s
  Coefficient of decay            KD     = 0 /s
-------------------------------------------------------------------------------
FLUX VARIABLES PER UNIT DIFFUSER LENGTH:
  Discharge (volume flux)         q0     = 0.014614 m^2/s
  Momentum flux                   m0     = 0.074938 m^3/s^2
  Buoyancy flux                   j0     = 0.000770 m^3/s^3
-------------------------------------------------------------------------------
DISCHARGE/ENVIRONMENT LENGTH SCALES:
  LQ  = 0.00 m        Lm  = 6.23 m        LM  = 8.90 m
  lm' = 99999 m       Lb' = 99999 m       La  = 99999 m
  (These refer to the actual discharge/environment length scales.)
-------------------------------------------------------------------------------
NON-DIMENSIONAL PARAMETERS:
Slot Froude number          FR0    = 418.50
  Port/nozzle Froude number FRD0   = 80.93
  Velocity ratio            R      = 46.74
-------------------------------------------------------------------------------
MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:
  Toxic discharge                  = no
  Water quality standard specified = yes
  Water quality standard           CSTD   = 1200 mg/l
  Regulatory mixing zone           = no
  Region of interest               = 3657 m downstream
*******************************************************************************
HYDRODYNAMIC CLASSIFICATION:
  *------------------------*
  | FLOW CLASS   = MU8 |
  *------------------------*
  This flow configuration applies to a layer corresponding to the full water
  depth at the discharge site.
  Applicable layer depth = water depth = 3.5 m
*******************************************************************************
MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):
```

```
--------------------------------------------------------------------------------
X-Y-Z Coordinate system:
  Origin is located at the bottom below the port center:
    10.06 m from the left bank/shore.
  Number of display steps NSTEP = 800 per module.
--------------------------------------------------------------------------------
NEAR-FIELD REGION (NFR) CONDITIONS :
Note: The NFR is the zone of strong initial mixing.  It has no regulatory
  implication.  However, this information may be useful for the discharge
  designer because the mixing in the NFR is usually sensitive to the
  discharge design conditions.
  Pollutant concentration at NFR edge  c = 199.246900 mg/l
  Dilution at edge of NFR              s = 30.1
  NFR Location:                        x = 30.58 m
    (centerline coordinates)           y = 0 m
                                       z = 3.5 m
  NFR plume dimensions:  half-width (bh) = 8.66 m
                           thickness (bv) = 2.97 m
Cumulative travel time:       39.4468 sec.
--------------------------------------------------------------------------------
Buoyancy assessment:
  The effluent density is less than the surrounding ambient water
  density at the discharge level.
  Therefore, the effluent is POSITIVELY BUOYANT and will tend to rise towards
  the surface.
--------------------------------------------------------------------------------
Near-field instability behavior:
  The diffuser flow will experience instabilities with full vertical mixing
  in the near-field.
  There may be benthic impact of high pollutant concentrations.
--------------------------------------------------------------------------------
UPSTREAM INTRUSION SUMMARY:
Plume exhibits upstream intrusion due to low ambient velocity or strong
  discharge buoyancy.
  Intrusion length                    =  0.75 m
  Intrusion stagnation point          =  25.50 m
  Intrusion thickness                 =  13.76 m
  Intrusion half width at impingement     =  8.66 m
  Intrusion half thickness at impingement =  2.97 m
--------------------------------------------------------------------------------
FAR-FIELD MIXING SUMMARY:
  Plume is vertically fully mixed WITHIN NEAR-FIELD (or a fraction thereof),
  but RE-STRATIFIES LATER.
  Plume becomes vertically fully mixed again at 1307.04 m downstream.
--------------------------------------------------------------------------------
PLUME BANK CONTACT SUMMARY:
  Plume in bounded section contacts one bank only at 33.73 m downstream.
************************ TOXIC DILUTION ZONE SUMMARY ************************
No TDZ was specified for this simulation.
*********************** REGULATORY MIXING ZONE SUMMARY ***********************
No RMZ has been specified.
However:
The ambient water quality standard was encountered within a control
  volume describing a portion of the discharge plume.
Therefore, the following plume conditions are a conservative estimate (with
  lower concentrations or with larger dimensions) for the region at whose
  boundary the standard is met:
```

```
  Local boundary concentration          = 210.663800  mg/l
Corresponding dilution                  = 30.113400
  Water quality standard                = 1200  mg/l
  Corresponding dilution              s = 5
  Plume location:                     x = 30.58 m
    (centerline coordinates)          y = 0 m
                                      z = 3.5 m
  Plume dimensions:      half-width (bh) = 8.66 m
                          thickness (bv) = 2.97 m
```

STEADY STATE TOXICS WASTELOAD ALLOCATION MODEL (SSTWAM2004) – REASONABLE POTENTIAL ANALYSIS – OUTFALL 001

Permit Writer	Sara Beard	
Date Entered	1/7/2009	
Facility Name	Westlake Vinyls, Inc.	
KPDES Number	KY0003484	
Outfall Number	001	
Case	Reissuance	
Status: **Is this an existing facility – Enter "E"** **Is this an existing facility with an increase in pollutant load – Enter "I"** **Is this a new facility – Enter "N"** **Is this a regional facility with an approved up-to-date 201 plan – Enter "R"** **Has the permittee made a successful alternatives analysis/socioeconomic demonstration – Enter "A"**	E	
Receiving Water Name	Tennessee River	
Discharge Mile Point	17.9	
Public Water Supply Name		
Intake Water Name	Tennessee River	
Intake Mile Point		
Total Effluent Flow (Q_T)	4.27	MGD
Receiving Water 7Q10 (Q_{RW7Q10})	5000.00	cfs
Receiving Water Harmonic Mean (Q_{RWHM})	40283.00	cfs
Receiving Water pH	7.50	SU
Receiving Water Temperature	19.00	^{o}C
Intake Water 7Q10 (Q_{IW7Q10})	5000.00	cfs
Intake Water Harmonic Mean (Q_{IWHM})	40283.00	cfs
Effluent Hardness	150	(as mg/l CaCO3)
Receiving Water Hardness	100	(as mg/l CaCO3)
Zone of Initial Dilution (ZID)	10.01	
Mixing Zone (MZ) *	0.072	
Acute to Chronic Ratio (ACR)	0.10	
Impaired	No	
Permittee agrees to accept no mixing zone for bioaccumulative or persistent pollutants prior to 09/08/2014	No	

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Calculation Methodology

Definitions

Acute to Chronic Ratio	ACR	Total Effluent Flow	Q_T
Aquatic Life Acute Criteria	C_A	Receiving Water 7Q10	Q_{RW7Q10}
Aquatic Life Chronic Criteria	C_C	Receiving Water Harmonic Mean	Q_{RWHM}
Human Health Criteria - Fish Only	C_{HHFO}	Intake Water 7Q10	Q_{IW7Q10}
Human Health Criteria - Fish & Water	C_{HHFW}	Intake Water Harmonic Mean	Q_{IWHM}
End of Pipe Effluent Limit	C_T	Zone of Initial Dilution	ZID
Instream Background Concentration	C_U	Mixing Zone	MZ
Toxicity Units - Acute	TU_a	Toxicity Units - Chronic	TU_c
Effluent Hardness	H_T	Receiving Water Hardness	H_{RW}

Aquatic Life - Chemical Specific

Acute
NO ZID given $C_T = C_A$
ZID given $C_T = (C_A - C_U) \times (ZID)$

Chronic Mixing Zone / Complete Mix
$C_T = \{C_C[Q_T + (MZ)(Q_{RW7Q10})] - [C_U(MZ)(Q_{RW7Q10})]\}/Q_T$

Human Health - Chemical Specific

Fish Only: Mixing Zone / Complete Mix
Carcinogen / Non-Carcinogen $C_T = \{C_{HHFO}[Q_T + (MZ)(Q_{RWHM})] - C_U(MZ)(Q_{RWHM})\}/Q_T$

Fish & Water Only: Mixing Zone / Applicable at point of withdrawal
Carcinogen $C_T = \{C_{HHFW}[Q_T + (Q_{IWHM})] - C_U(Q_{IWHM})\}/Q_T$
Non-Carcinogen $C_T = \{C_{HHFW}[Q_T + (Q_{IW7Q10})] - C_U(Q_{IW7Q10})\}/Q_T$

Aquatic Life - Whole Effluent Toxicity

Acute (Units TU_a)
NO ZID given CT = CA
ZID given $C_T = (C_A - C_U) \times (ZID)$

Chronic Mixing Zone / Complete Mix (Units TUc)
$C_T = \{C_C[Q_T + (MZ)(Q_{RW7Q10})] - [C_U(MZ)(Q_{RW7Q10})]\}/Q_T$
Conversion of TU_c to TU_a: $TU_c \times ACR = TU_a$

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Metal Aquatic Criteria

Pollutant	Acute Criteria	Chronic Criteria
Total Recoverable Cadmium	$e^{(1.0166 (\ln Hardness) - 3.924)}$	$e^{(0.7409 (\ln Hardness) - 4.719)}$
Chromium III	$e^{(0.8190 (\ln Hardness) + 3.7256)}$	$e^{(0.8190 (\ln Hardness) + 0.6848)}$
Total Recoverable Copper	$e^{(0.9422 (\ln Hardness) - 1.700)}$	$e^{(0.8545 (\ln Hardness) - 1.702)}$
Total Recoverable Lead	$e^{(1.273 (\ln Hardness) - 1.460)}$	$e^{(1.273 (\ln Hardness) - 4.705)}$
Total Recoverable Nickel	$e^{(0.8460 (\ln Hardness) + 2.255)}$	$e^{(0.8460(\ln Hardness) + 0.0584)}$
Total Recoverable Silver	$e^{(1.72 (\ln Hardness) - 6.59)}$	
Total Recoverable Zinc	$e^{(0.8473 (\ln Hardness) + 0.884)}$	$e^{(0.8473 (\ln Hardness) + 0.884)}$

Hardness (as mg/l $CaCO_3$)

Zone Initial Dilution (ZID) $H_{RW} + [H_T + H_{RW}]/ZID$

Mixing Zone $[(Q_{RW7Q10})(MZ)(H_{RW}) + (Q_T)(H_T)]/[(QRW7Q10)(MZ)+(QT)]$

Total Ammonia Criteria

Chronic - applies state wide - unionzed criteria of 0.05 mg/l $[0.05*(1+10^{(pka-pH)})]/1.2$ $pka=(0.0902+(2730/(273.1+T))$ T = Temperature ^oC

Acute - applies to the Ohio River (ORSANCO Criteria) $[0.411/(1+10^{(7.204-pH)})]+[58.4/(1+10^{(pH-7.204)})]$

Bioaccumulative or Persistent

For new facilities after September 8, 2004 mixing zones shall not be granted for bioaccumulative or persistent pollutants of concern.

Mixing zones for bioaccumulative or persistent pollutants of concerned assigned prior to September 8, 2004 shall expire no later than September 8, 2014, unless the permittee agrees to expiration of the mixing zone prior to that date.

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Reasonable Potential Analysis

In establishing water quality based effluent conditions the Division of Water must determine if the pollutant concentrations in the discharge will cause, have the reasonable potential to cause, or contribute to an excursion of any water standard. The process by which the Division of Water makes this determination is known as a Reasonable Potential Analysis.

A Reasonable Potential Analysis is performed by first calculating the expected effluent limitations for those pollutants with water quality criteria. The calculated limits are then compared to the concentrations reported on the KPDES permit application and/or a summarization of the values reported on the Discharge Monitoring Report (DMRs) submitted during the term of the permit. This comparison is made by dividing the reported value by the calculated effluent limitation and converting to a percentage. The following criteria are used in determining how the pollutant will be addressed in the permit.

New Permits or New Pollutants on Permit Renewals

If the reported concentration is less than 70% of the calculated effluent limit then no monitoring or limitations will be required.

If the reported concentration is equal to or greater than 70% but less than 90% of the calculated effluent limit then monitoring will be required.

If the reported concentration is equal to or greater than 90% and the number of analysis reported on the KPDES permit application is less than 12 then monitoring will be required.

If the reported concentration is equal to or greater than 90% and the number of analysis reported on the KPDES permit application is equal or greater than 12 then an effluent limitation will be required.

Permit Renewals - Existing Pollutants

If the reported concentration is less than 70% of the calculated effluent limit then and the source of the reported concentration was the DMRs for that facility and there were more than 12 DMRs utilized to determine the reported concentrations then the pollutant will be removed from the permit.

If the reported concentration is equal to or greater than 70% but less than 90% of the calculated effluent limit then monitoring will be required.

If the reported concentration is equal to or greater than 90% then an effluent limitation will be required.

In all cases, the Division of Water still may exercise its Best Professional Judgment in the implementation of the results.

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Parameter	CAS Number	Reported Discharge (mg/l)		Calculated Effluent Limitations (mg/l)		Reasonable Potential		Data Source	No. of Samples	Effluent Requirement		Justification	
		Average	Maximum	Average	Maximum	Average	Maximum			Average	Maximum	Average	Maximum
Chloride	16887006	2,944.000000	4,065.000000	12,024.000000	12,024.000000	8.85%	33.81%	DMR	93	Remove	Remove	Chronic	Acute
Total Residual Chlorine		0.014000	0.030000	0.190380	0.190380	2.29%	15.76%	DMR	93	Remove	Remove	Chronic	Acute
Color		0.000000	0.000000	56.808021	NA	0.00%	0.00%	No Data	0	None	None	HH DWS	NA
Fluoride		0.000000	0.000000	1,514.880562	NA	0.00%	0.00%	No Data	0	None	None	HH DWS	NA
Nitrate-Nitrite (as N)	14797558	0.000000	0.000000	7,574.402810	NA	0.00%	0.00%	No Data	0	None	None	HH DWS	NA
Total Alpha		0.000000	0.000000	NA	150.300000	0.00%	0.00%	No Data	0	None	None	NA	Acute
Total Beta		0.000000	0.000000	NA	501.000000	0.00%	0.00%	No Data	0	None	None	NA	Acute
Total Radium		0.000000	0.000000	NA	50.100000	0.00%	0.00%	No Data	0	None	None	NA	Acute
Sulfate (as SO4)		0.000000	0.000000	189,360.070258	NA	0.00%	0.00%	No Data	0	None	None	HH DWS	NA
Surfactants		0.000000	0.000000	378.720141	NA	0.00%	0.00%	No Data	0	None	None	HH DWS	NA
Total Recoverable Barium	7440393	0.000000	0.000000	757.440281	NA	0.00%	0.00%	No Data	0	None	None	HH DWS	NA
Total Recoverable Iron	7439896	0.000000	0.000000	40.080000	40.080000	0.00%	0.00%	No Data	0	None	None	Chronic	Acute
Total Recoverable Antimony	7440360	0.000000	0.000000	4.241666	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Total Recoverable Arsenic	7440382	0.000000	0.000000	3.406800	3.406800	0.00%	0.00%	No Data	0	None	None	Chronic	Acute
Total Recoverable Beryllium	7440417	0.000000	0.000000	3.029761	NA	0.00%	0.00%	No Data	0	None	None	HH DWS	NA
Total Recoverable Cadmium	7440439	0.000000	0.000000	0.015075	0.022459	0.00%	0.00%	No Data	0	None	None	Chronic	Acute
Total Recoverable Chromium	7440439	0.000000	0.000000	75.744028	NA	0.00%	0.00%	No Data	0	None	None	HH DWS	NA
Total Recoverable Copper	7440508	0.035000	0.035000	0.146856	0.146856	6.73%	23.83%	DMR	82	Remove	Remove	Chronic	Acute
Total Recoverable Lead	7439921	0.000000	0.000000	0.177781	0.870401	0.00%	0.00%	No Data	0	None	None	Chronic	Acute
Total Recoverable Mercury	7439976	0.001000	0.003000	0.017034	0.017034	4.46%	17.61%	DMR	79	Remove	Remove	HH Fish	Acute
Total Recoverable Nickel	7440020	0.000000	0.000000	2.907494	4.898837	0.00%	0.00%	No Data	0	None	None	Chronic	Acute
Total Recoverable Selenium	7782492	0.000000	0.000000	0.200400	0.200400	0.00%	0.00%	No Data	0	None	None	Chronic	Acute
Total Recoverable Silver	7440224	0.000000	0.000000	NA	0.041233	0.00%	0.00%	No Data	0	None	None	NA	Acute
Total Recoverable Thallium	7440280	0.000000	0.000000	1.287648	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Total Recoverable Zinc	7440666	0.026000	0.026000	1.251131	1.251131	0.39%	2.08%	DMR	79	Remove	Remove	Chronic	Acute
Free Cyanide	57125	0.000000	0.000000	0.220440	0.220440	0.00%	0.00%	No Data	0	None	None	Chronic	Acute
2,3,7,8 Tetrachlorodibenzo P Dioxin	1746016	0.000000	0.000000	0.000000	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Acrolein	107028	0.000000	0.000000	127.539752	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Acrylonitrile	107131	0.000000	0.000000	0.109948	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Benzene	71432	0.027000	0.049000	13.409741	NA	0.20%	0.00%	DMR	25	Remove	Remove	HH Fish	NA
Bromoform	75252	0.000000	0.000000	26.209948	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Carbon Tetrachloride	56235	0.000000	0.000000	0.703668	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Chlorobenzene	108907	0.000000	0.000000	515.059391	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Chlorodibromomethane	124481	0.000000	0.000000	2.438135	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Chloroform	67663	0.023000	0.023000	34.743420	NA	0.07%	0.00%	DMR	87	Remove	Remove	HH Fish	NA
Dichlorobromomethane	75274	0.000000	0.000000	3.352435	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
1,2-Dichloroethane	107062	0.087000	0.263000	2.316228	NA	3.76%	0.00%	DMR	93	Remove	Remove	HH Fish	NA
1,1-Dichloroethylene	75354	0.000000	0.000000	0.347434	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
1,2-Dichloropropane	78875	0.000000	0.000000	0.304767	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
1,3-Dichloropropene	542756	0.000000	0.000000	7.574403	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Ethylbenzene	100414	0.007500	0.007500	2,348.064871	NA	0.00%	0.00%	DMR	3	Monitoring	Monitoring	HH Fish	NA
Methyl Bromide	74839	0.000000	0.000000	35.599693	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Methylene Chloride	75092	0.000000	0.000000	28.038549	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
1,1,2,2-Tetrachloroethane	79345	0.000000	0.000000	1.036207	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Tetrachloroethylene	127184	0.000000	0.000000	1.451314	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Toluene	108883	0.020000	0.020000	5,150.593911	NA	0.00%	0.00%	DMR	20	Remove	Remove	HH Fish	NA
1,2-Trans-Dichloroethylene	156605	0.000000	0.000000	4,266.735738	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA

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		Average	Maximum	Average	Maximum	Average	Maximum			Average	Maximum	Average	Maximum
1,1,1-Trichloroethane	71556	0.000000	0.000000	151.488056	NA	0.00%	0.00%	No Data	0	None	None	HH DWS	NA
1,1,2-Trichloroethane	79005	0.027000	0.027000	3.596249	NA	0.75%	0.00%	DMR	12	Remove	Remove	HH Fish	NA
Trichloroethylene	79016	0.000000	0.000000	13.193767	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Vinyl Chloride	75014	0.004200	0.004200	12.190674	NA	0.03%	0.00%	DMR	5	Monitoring	Monitoring	HH Fish	NA
2-Chlorophenol	95578	0.000000	0.000000	61.352663	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
2,4-Dichlorophenol	120832	0.000000	0.000000	58.322902	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
2,4-Dimethylphenol	105679	0.000000	0.000000	287.827307	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
2,4-Dinitrophenol	51285	0.000000	0.000000	52.263379	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Pentachlorophenol	87865	0.000000	0.000000	1.319377	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Phenol	108952	0.000000	0.000000	15,906.245902	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
2,4,6-Trichlorophenol	88062	0.000000	0.000000	1.055501	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Acenaphthene	83329	0.000000	0.000000	435.394325	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Anthracene	120127	0.010000	0.010000	6,286.754333	NA	0.00%	0.00%	DMR	1	Monitoring	Monitoring	HH Fish	NA
Benzidine	92875	0.000000	0.000000	0.000088	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Benzo(a)anthracene	56553	0.000000	0.000000	0.007916	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Benzo(a)pyrene	50328	0.000000	0.000000	0.007916	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Benzo(k)fluoranthene	205992	0.000000	0.000000	0.007916	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Bis(2-chloroisopropyl)ether	108601	0.000000	0.000000	1,060.416393	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Bis(2-ethylhexyl)phthalate	117817	0.000000	0.000000	0.967543	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Butylbenzyl phthalate	85687	0.000000	0.000000	835.605270	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
2-Chloronaphthalene	91587	0.000000	0.000000	703.667596	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Chrysene	218019	0.000000	0.000000	0.007916	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Dibenzo(a,h)anthracene	53703	0.000000	0.000000	0.007916	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
1,2-Dichlorobenzene	95501	0.000000	0.000000	2,045.088759	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
1,3-Dichlorobenzene	541731	0.000000	0.000000	242.380890	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
1,4-Dichlorobenzene	106467	0.000000	0.000000	302.976112	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
3,3-Dichlorobenzidine	91941	0.000000	0.000000	0.012314	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Diethyl phthalate	84662	0.000000	0.000000	12,876.484778	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Dimethyl phthalate	131113	0.000000	0.000000	204,508.875878	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Di-n-butyl phthalate	84742	0.000000	0.000000	1,514.880562	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
2,4-Dinitrotoluene	121142	0.000000	0.000000	0.670487	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
1,2-Diphenylhydrazine	122667	0.000000	0.000000	0.087958	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Fluoranthene	206440	0.000000	0.000000	61.570915	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Fluorene	86737	0.008000	0.008000	833.184309	NA	0.00%	0.00%	DMR	14	Remove	Remove	HH Fish	NA
Hexachlorobenzene	118741	0.001400	0.001400	0.000128	NA	1097.70%	0.00%	DMR	32	Limit	Remove	HH Fish	NA
Hexachlorobutadiene	87683	0.000000	0.000000	2.681948	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Hexachlorocyclopentadiene	77474	0.000000	0.000000	181.785667	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Hexachloroethane	67721	0.000000	0.000000	1.451314	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Ideno(1,2,3-cd)pyrene	193395	0.000000	0.000000	0.002878	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Isophorone	78591	0.000000	0.000000	26.510410	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Nitrobenzene	98953	0.000000	0.000000	12.876485	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
N-Nitrosodimethylamine	62759	0.000000	0.000000	0.004206	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
N-Nitrosodi-n-Propylamine	621647	0.000000	0.000000	0.030477	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
N-Nitrosodiphenylamine	86306	0.000000	0.000000	2.638753	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Pyrene	129000	0.006000	0.006000	628.675433	NA	0.00%	0.00%	DMR	2	Monitoring	Monitoring	HH Fish	NA
1,2,4-Trichlorobenzene	120821	0.000000	0.000000	196.934473	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Aldrin	309002	0.000000	0.000000	0.000022	0.030060	0.00%	0.00%	No Data	0	None	None	HH Fish	Acute

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		Average	Maximum	Average	Maximum	Average	Maximum			Average	Maximum	Average	Maximum
alpha-BHC	319846	0.000000	0.000000	0.002155	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Beta-BHC	319857	0.000000	0.000000	0.007476	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
gamma-BHC (Lindane)	58899	0.000000	0.000000	0.009519	0.009519	0.00%	0.00%	No Data	0	None	None	HH Fish	Acute
Chlordane	57749	0.000000	0.000000	0.000238	0.024048	0.00%	0.00%	No Data	0	None	None	HH Fish	Acute
4,4'-DDT	50293	0.000000	0.000000	0.000055	0.011022	0.00%	0.00%	No Data	0	None	None	HH Fish	Acute
4,4'-DDE	72559	0.000000	0.000000	0.000097	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
4,4'-DDD	72548	0.000000	0.000000	0.000136	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Dieldrin	60571	0.000000	0.000000	0.000024	0.002405	0.00%	0.00%	No Data	0	None	None	HH Fish	Acute
Alpha-Endosulfan	959988	0.000000	0.000000	0.002204	0.002204	0.00%	0.00%	No Data	0	None	None	Chronic	Acute
Beta-Endosulfan	33213659	0.000000	0.000000	0.002204	0.002204	0.00%	0.00%	No Data	0	None	None	Chronic	Acute
Endosulfan sulfate	1031078	0.000000	0.000000	39.141510	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Endrin	72208	0.000000	0.000000	0.000862	0.000862	0.00%	0.00%	No Data	0	None	None	Chronic	Acute
Endrin aldehyde	7421934	0.000000	0.000000	0.131938	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Heptachlor	76448	0.000000	0.000000	0.000035	0.005210	0.00%	0.00%	No Data	0	None	None	HH Fish	Acute
Heptachlor epoxide	1024573	0.000000	0.000000	0.000017	0.005210	0.00%	0.00%	No Data	0	None	None	HH Fish	Acute
Polychlorinated Biphenyls (PCBs)		0.000000	0.000000	0.000028	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Toxaphene	8001352	0.000000	0.000000	0.000011	0.007315	0.00%	0.00%	No Data	0	None	None	Chronic	Acute
1,2,4,5-Tetrachlorobenzene	95943	0.000000	0.000000	0.483771	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
2-methyl-4,6-dinitrophenol	534521	0.000000	0.000000	9.846724	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
2,4-D	94757	0.000000	0.000000	426.673574	NA	0.00%	0.00%	No Data	0	None	None	HH DWS	NA
2,4,5-TP (Silvex)	93721	0.000000	0.000000	7.574403	NA	0.00%	0.00%	No Data	0	None	None	HH DWS	NA
2,4,5-trichlorophenol	95954	0.000000	0.000000	1,363.392506	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Asbestos	1332214	0.000000	0.000000	42,667,357.377049	NA	0.00%	0.00%	No Data	0	None	None	HH DWS	NA
Benzo(b)fluoranthene	205992	0.000000	0.000000	0.007916	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Bis(2-chloroethyl)ether	111444	0.000000	0.000000	0.182860	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Bis(chloromethyl)ether	542881	0.000000	0.000000	0.000128	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Chloropyrifos	2921882	0.000000	0.000000	0.000832	0.000832	0.00%	0.00%	No Data	0	None	None	Chronic	Acute
Chromium (III)	16065831	0.000000	0.000000	4.802776	18.801629	0.00%	0.00%	No Data	0	None	None	Chronic	Acute
Chromium (VI)	18540299	0.000000	0.000000	0.160320	0.160320	0.00%	0.00%	DMR	93	Remove	Remove	Chronic	Acute
Demeton	8065483	0.000000	0.000000	0.005546	NA	0.00%	0.00%	No Data	0	None	None	Chronic	NA
Dinitrophenols	25550587	0.000000	0.000000	52.263379	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Guthion	86500	0.000000	0.000000	0.000555	NA	0.00%	0.00%	No Data	0	None	None	Chronic	NA
Hexachlorocyclo-hexane-Technical	319868	0.000000	0.000000	0.018207	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Hydrogen Sulfide, Undissociated	7783064	0.000000	0.000000	0.110927	NA	0.00%	0.00%	No Data	0	None	None	Chronic	NA
Malathion	121755	0.000000	0.000000	0.005546	NA	0.00%	0.00%	No Data	0	None	None	Chronic	NA
Methoxychlor	72435	0.000000	0.000000	0.001664	NA	0.00%	0.00%	No Data	0	None	None	Chronic	NA
Mirex	2385855	0.000000	0.000000	0.000055	NA	0.00%	0.00%	No Data	0	None	None	Chronic	NA
Nitrosamines, Other		0.000000	0.000000	0.000606	NA	0.00%	0.00%	No Data	0	None	None	HH DWS	NA
N-Nitrosodibutylamine	924163	0.000000	0.000000	0.038401	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
N-Nitrosodiethylamine	55185	0.000000	0.000000	0.004876	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
N-Nitrosopyrrolidine	930552	0.000000	0.000000	0.097525	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Parathion	56382	0.000000	0.000000	0.000651	0.000651	0.00%	0.00%	No Data	0	None	None	Chronic	Acute
Pentachlorobenzene	608935	0.000000	0.000000	0.659688	NA	0.00%	0.00%	No Data	0	None	None	HH Fish	NA
Phthalate esters		0.000000	0.000000	0.166391	NA	0.00%	0.00%	No Data	0	None	None	Chronic	NA
Total Dissolved Solids		0.000000	0.000000	568,080.210773	NA	0.00%	0.00%	No Data	0	None	None	HH DWS	NA
Tritium		0.000000	0.000000	NA	200,400.000000	0.00%	0.00%	No Data	0	None	None	NA	Acute
Total Strontium-90		0.000000	0.000000	NA	80.160000	0.00%	0.00%	No Data	0	None	None	NA	Acute

STEADY STATE TOXICS WASTELOAD ALLOCATION MODEL (SSTWAM2004) – REASONABLE POTENTIAL ANALYSIS – OUTFALL 001

Parameter	CAS Number	Reported Discharge (mg/l)		Calculated Effluent Limitations (mg/l)		Reasonable Potential		Data Source	No. of Samples	Effluent Requirement		Justification	
		Average	Maximum	Average	Maximum	Average	Maximum			Average	Maximum	Average	Maximum
Uranium		0.000000	0.000000	NA	0.300600	0.00%	0.00%	No Data	0	None	None	NA	Acute
Total Ammonia		0.000000	0.000000	186.408566	199.299848	0.00%	0.00%	No Data	0	None	None	Chronic	Acute

Hardness	Chronic	Acute
Metal limitations are developed using the mixed hardness of the effluent and receiving waters	100.42	150.00

Toxicity

Type of Test	Maximum	Units	Justification	Percent Effluent
Acute	1.00	TUa	Chronic	100.00%

ATTACHMENT D - REGULATORY REQUIREMENTS

EFFLUENT GUIDELINES

PART 414 - ORGANIC CHEMICALS, PLASTICS, AND SYNTHETIC FIBERS POINT SOURCE CATEGORY

Subpart F – Commodity Organic Chemicals

Section 414.61 – Best Practicable Control Technology Currently Available (BPT)

Except as provided in 40 CFR 125.30 through 125.32, and in 40 CFR 414.11(i) for point sources with production in two or more subcategories, any existing point source subject to this subpart must achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentration listed in the following table.

Effluent Characteristic	Maximum for Any 1 Day (mg/l)	Maximum for Monthly Average (mg/l)
BOD_5	80	30
Total Suspended Solids	149	46
pH	Within the range of 6.0 to 9.0 at all times	

Subpart H – Specialty Organic Chemicals

Section 414.81 – Best Practicable Control Technology Currently Available (BPT)

Except as provided in 40 CFR 125.30 through 125.32, and in 40 CFR 414.11(i) for point sources with production in two or more subcategories, any existing point source subject to this subpart must achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentration listed in the following table.

Effluent Characteristic	Maximum for Any 1 Day (mg/l)	Maximum for Monthly Average (mg/l)
BOD_5	120	45
Total Suspended Solids	183	57
pH	Within the range of 6.0 to 9.0 at all times	

Subpart I - Direct Discharge Point Sources That Use End-Of-Pipe Biological Treatment

Section 414.91 - Toxic pollutant effluent limitations and standards for direct discharge point sources that use end-of-pipe biological treatment

(a) Any point source subject to this subpart must achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentrations in the following table.

(b) In the case of chromium, copper, lead, nickel, zinc, and total cyanide, the discharge quantity (mass) shall be determined by multiplying the concentrations listed in the following table for these pollutants times the flow from metal-bearing waste streams for the metals and times the flow from cyanide bearing waste streams for total cyanide. The metal-bearing waste streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this part, plus any additional OCPSF process wastewater streams identified by the permitting authority on a case-by-case basis as metal or

cyanide bearing based upon a determination that such streams contain significant amounts of the pollutants identified above. Any such streams designated as metal or cyanide bearing must be treated independently of other metal or cyanide bearing waste streams unless the permitting authority determines that the combination of such streams, prior to treatment, with the Appendix A waste streams will result in substantial reduction of these pollutants. This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Effluent Characteristic	Effluent limitations BAT and NSPS[1]	
	Maximum for Any 1 Day	Maximum for Monthly Average
Acenaphthene	59	22
Acenaphthylene	59	22
Acrylonitrile	242	96
Anthracene	59	22
Benzene	136	37
Benzo(a)anthracene	59	22
3,4-Benzofluoranthene	61	23
Benzo(k)fluoranthene	59	22
Benzo(a)pyrene	61	23
Bis(2-ethylhexyl) phthalate	279	103
Carbon Tetrachloride	38	18
Chlorobenzene	28	15
Chloroethane	268	104
Chloroform	46	21
2-Chlorophenol	98	31
Chrysene	59	22
Di-n-butyl phthalate	57	27
1,2-Dichlorobenzene	163	77
1,3-Dichlorobenzene	44	31
1,4-Dichlorobenzene	28	15
1,1-Dichloroethane	59	22
1,2-Dichloroethane	211	68
1,1-Dichloroethylene	25	16
1,2-trans-Dichloroethylene	54	21
2,4-Dichlorophenol	112	39
1,2-Dichloropropane	230	153
1,3-Dichloropropylene	44	29
Diethyl phthalate	203	81
2,4-Dimethylphenol	36	18
Dimethyl phthalate	47	19
4,6-Dinitro-o-cresol	277	78
2,4-Dinitrophenol	123	71
2,4-Dinitrotoluene	285	113
2,6-Dinitrotoluene	641	255
Ethylbenzene	108	32
Fluoranthene	68	25
Fluorene	59	22
Hexachlorobenzene	28	15
Hexachlorobutadiene	49	20
Hexachloroethane	54	21
Methyl Chloride	190	86
Methylene Chloride	89	40

Naphthalene	59	22
Nitrobenzene	68	27
2-Nitrophenol	69	41
4-Nitrophenol	124	72
Phenanthrene	59	22
Phenol	26	15
Pyrene	67	25
Tetrachloroethylene	56	22
Toluene	80	26
Total Chromium	2,770	1,110
Total Copper	3,380	1,450
Total Cyanide	1,200	420
Total Lead	690	320
Total Nickel	3,980	1,690
Total Zinc[2]	2,610	1,050
1,2,4-Trichlorobenzene	140	68
1,1,1-Trichloroethane	54	21
1,1,2-Trichloroethane	54	21
Trichloroethylene	54	21
Vinyl Chloride	268	104

[1]All units are micrograms per liter.

[2]Total Zinc for Rayon Fiber Manufacture that uses the viscose process and Acrylic Fiber Manufacture that uses the zinc chloride/solvent process is 6,796 µg/l and 3,325 µg/l for maximum for any one day and maximum for monthly average, respectively.

Subpart J - Direct Discharge Point Sources That Do Not Use End-Of-Pipe Biological Treatment

Section 414.101 - Toxic pollutant effluent limitations and standards for direct discharge point sources that do not use end-of-pipe biological treatment.

(a)Any point source subject to this subpart must achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to this subpart times the concentrations in the following table.

(b) In the case of chromium, copper, lead, nickel, zinc, and total cyanide, the discharge quantity (mass) shall be determined by multiplying the concentrations listed in the following table for these pollutants times the flow from metal bearing waste streams for the metals and times the cyanide-bearing waste streams for total cyanide. The metal-bearing waste streams and cyanide-bearing waste streams are defined as those waste streams listed in Appendix A of this part, plus any additional OCPSF process wastewater streams identified by the permitting authority on a case-by-case basis as metal or cyanide bearing based upon a determination that such streams contain significant amounts of the pollutants identified above. Any such streams designated as metal or cyanide bearing must be treated independently of other metal or cyanide bearing waste streams unless the permitting authority determines that the combination of such streams, prior to treatment, with the Appendix A waste streams will result in substantial reduction of these pollutants. This determination must be based upon a review of relevant engineering, production, and sampling and analysis information.

Effluent Characteristic	Effluent limitations BAT and NSPS[1]	
	Maximum for Any 1 Day	Maximum for Monthly Average
Acenaphthene	47	19
Acenaphthylene	47	19
Acrylonitrile	232	94
Anthracene	47	19
Benzene	134	57
Benzo(a)anthracene	47	19
3,4-Benzofluoranthene	48	20
Benzo(k)fluoranthene	47	19
Benzo(a)pyrene	48	20
Bis(2-ethylhexyl) phthalate	258	95
Carbon Tetrachloride	380	142
Chlorobenzene	380	142
Chloroethane	295	110
Chloroform	325	111
Chrysene	47	19
Di-n-butyl phthalate	43	20
1,2-Dichlorobenzene	794	196
1,3-Dichlorobenzene	380	142
1,4-Dichlorobenzene	380	142
1,1-Dichloroethane	59	22
1,2-Dichloroethane	574	180
1,1-Dichloroethylene	60	22
1,2-trans-Dichloroethylene	66	25
1,2-Dichloropropane	794	196
1,3-Dichloropropylene	794	196
Diethyl phthalate	113	46
2,4-Dimethylphenol	47	19
Dimethyl phthalate	47	19
4,6-Dinitro-o-cresol	277	78
2,4-Dinitrophenol	4,291	1,207
Ethylbenzene	380	142
Fluoranthene	54	22
Fluorene	47	19
Hexachlorobenzene	794	196
Hexachlorobutadiene	380	142
Hexachloroethane	794	196
Methyl Chloride	295	110
Methylene Chloride	170	36
Naphthalene	47	19
Nitrobenzene	6,402	2,237
2-Nitrophenol	231	65
4-Nitrophenol	576	162
Phenanthrene	47	19
Phenol	47	19
Pyrene	48	20
Tetrachloroethylene	164	52
Toluene	74	28
Total Chromium	2,770	1,110
Total Copper	3,380	1,450

Total Cyanide	1,200	420
Total Lead	690	320
Total Nickel	3,980	1,690
Total Zinc2	2,610	1,050
1,2,4-Trichlorobenzene	794	196
1,1,1-Trichloroethane	59	22
1,1,2-Trichloroethane	127	32
Trichloroethylene	69	26
Vinyl Chloride	172	97

PART 415 - INORGANIC CHEMICALS MANUFACTURING POINT SOURCE CATEGORY

Subpart F – Chlor-Alkali Subcategory (Chlorine And Sodium Or Potassium Hydroxide Production)

Section 415.60 – Applicability; description of the chlorine and sodium or potassium hydroxide production subcategory

The provisions of this subpart are applicable to discharges resulting from the production of chlorine and sodium or potassium hydroxide by the diaphragm cell process and by the mercury cell process.

WATER QUALITY STANDARDS

401 KAR 10:031, SECTION 4

Pollutant or Pollutant Characteristic	Maximum for Any 1 Day (mg/l)	Maximum for Monthly Average (mg/l)
BOD_5	45	30
Total Suspended Solids	45	30

LIMITS CALCULATIONS – Outfall 002

TECHNOLOGY BASED LIMITATIONS

Monthly Average = Σ Monthly Average Components

Daily Maximum = Σ Daily Maximum Components

Sanitary Component:

Monthly Average = Σ(Average Flow **X** Average Factor)

Daily Maximum = Σ(Average Flow **X** Maximum Factor)

Where: Average Flow is in MGD
Average Factor is the average of the daily values for 30 consecutive days
Maximum Factor is the maximum for any one (1) day

Monthly Average = Design Flow x 8.345 x Secondary Treatment Monthly Average
Daily Maximum = Design Flow x 8.345 x Secondary Treatment Daily Maximum

401 KAR 10:031, Section 4 – Water Quality Standards			
Pollutant or Pollutant Property	**Average Flow (MGD)**	**Daily Maximum (lbs/day)**	**Monthly Average (lbs/day)**
BOD_5	0.58525	219.78	146.52
Total Suspended Solids	0.58525	219.78	146.52

Specialty Polymers Component:

40 CFR 414.81 – Specialty Organic Chemicals (BPT)			
Pollutant or Pollutant Property	**Average Flow(MGD)**	**Daily Maximum (lbs/day)**	**Monthly Average (lbs/day)**
BOD_5	0.0501	50.17	18.81
Total Suspended Solids	0.0501	76.51	23.83

For calculations pertaining to 40 CFR 414.91 – End-of-Pipe Biological Treatment (BAT), see Table 1.

EDC/VCM Component:

40 CFR 414.61 – Commodity Organic Chemicals (BPT)			
Pollutant or Pollutant Property	**Average Flow(MGD)**	**Daily Maximum (lbs/day)**	**Monthly Average (lbs/day)**
BOD_5	0.4997	333.60	125.10
Total Suspended Solids	0.4997	621.33	191.82

For calculations pertaining to 40 CFR 414.91 – End-of-Pipe Biological Treatment (BAT), see Table 1.

Ethylene Plant Component:

40 CFR 414.61 – Commodity Organic Chemicals (BPT)			
Pollutant or Pollutant Property	**Average Flow(MGD)**	**Daily Maximum (lbs/day)**	**Monthly Average (lbs/day)**
BOD_5	0.2714	181.19	67.94
Total Suspended Solids	0.2714	337.46	104.18

For calculations pertaining to 40 CFR 414.91 – End-of-Pipe Biological Treatment (BAT), see Table 1.

Total Limitations

Pollutant or Pollutant Property	Daily Maximum (lbs/day)	Monthly Average (lbs/day)
BOD_5	784.78	358.37
Total Suspended Solids	1,255.08	466.35

Table 1 - 40 CFR 414.91 – End-of-Pipe Biological Treatment (BAT)

Effluent characteristics	Effluent limitations (40 CFR 414.91) BAT (µg/l)		Wastestream						Total for all Wastestreams (lbs/day)	
			Specialty Polymers		EDC/VCM		Ethylene Plant			
	Maximum for any one day	Maximum for any monthly average	Daily Max	Monthly Ave	Daily Max	Monthly Ave	Daily Max	Monthly Ave	Daily Max	Monthly Ave
Acenaphthene	59	22	0.025	0.009	0.246	0.092	0.134	0.050	**0.404**	**0.151**
Acenaphthylene	59	22	0.025	0.009	0.246	0.092	0.134	0.050	**0.404**	**0.151**
Acrylonitrile	242	96	0.101	0.040	1.009	0.400	0.548	0.217	**1.658**	**0.658**

Anthracene	59	22	0.025	0.009	0.246	0.092	0.134	0.050	**0.404**	**0.151**
Benzene	136	37	0.057	0.015	0.567	0.154	0.308	0.084	**0.932**	**0.254**
Benzo(a)anthracene	59	22	0.025	0.009	0.246	0.092	0.134	0.050	**0.404**	**0.151**
3,4-Benzofluoranthene	61	23	0.026	0.010	0.254	0.096	0.138	0.052	**0.418**	**0.158**
Benzo(k)fluoranthene	59	22	0.025	0.009	0.246	0.092	0.134	0.050	**0.404**	**0.151**
Benzo(a)pyrene	61	23	0.026	0.010	0.254	0.096	0.138	0.052	**0.418**	**0.158**
Bis(2-ethylhexyl) phthalate	279	103	0.117	0.043	1.163	0.430	0.632	0.233	**1.912**	**0.706**
Carbon Tetrachloride	38	18	0.016	0.008	0.158	0.075	0.086	0.041	**0.260**	**0.123**
Chlorobenzene	28	15	0.012	0.006	0.117	0.063	0.063	0.034	**0.192**	**0.103**
Chloroethane	268	104	0.112	0.043	1.118	0.434	0.607	0.236	**1.837**	**0.713**
Chloroform	46	21	0.019	0.009	0.192	0.088	0.104	0.048	**0.315**	**0.144**
2-Chlorophenol	98	31	0.041	0.013	0.409	0.129	0.222	0.070	**0.672**	**0.212**
Chrysene	59	22	0.025	0.009	0.246	0.092	0.134	0.050	**0.404**	**0.151**
Di-n-butyl phthalate	57	27	0.024	0.011	0.238	0.113	0.129	0.061	**0.391**	**0.185**
1,2-Dichlorobenzene	163	77	0.068	0.032	0.680	0.321	0.369	0.174	**1.117**	**0.528**
1,3-Dichlorobenzene	44	31	0.018	0.013	0.183	0.129	0.100	0.070	**0.302**	**0.212**
1,4-Dichlorobenzene	28	15	0.012	0.006	0.117	0.063	0.063	0.034	**0.192**	**0.103**
1,1-Dichloroethane	59	22	0.025	0.009	0.246	0.092	0.134	0.050	**0.404**	**0.151**
1,2-Dichloroethane	211	68	0.088	0.028	0.880	0.284	0.478	0.154	**1.446**	**0.466**
1,1-Dichloroethylene	25	16	0.010	0.007	0.104	0.067	0.057	0.036	**0.171**	**0.110**
1,2-trans-Dichloroethylene	54	21	0.023	0.009	0.225	0.088	0.122	0.048	**0.370**	**0.144**
2,4-Dichlorophenol	112	39	0.047	0.016	0.467	0.163	0.254	0.088	**0.768**	**0.267**
1,2-Dichloropropane	230	153	0.096	0.064	0.959	0.638	0.521	0.347	**1.576**	**1.048**
1,3-Dichloropropylene	44	29	0.018	0.012	0.183	0.121	0.100	0.066	**0.302**	**0.199**
Diethyl phthalate	203	81	0.085	0.034	0.847	0.338	0.460	0.183	**1.391**	**0.555**
2,4-Dimethylphenol	36	18	0.015	0.008	0.150	0.075	0.082	0.041	**0.247**	**0.123**
Dimethyl phthalate	47	19	0.020	0.008	0.196	0.079	0.106	0.043	**0.322**	**0.130**
4,6-Dinitro-o-cresol	277	78	0.116	0.033	1.155	0.325	0.627	0.177	**1.898**	**0.535**
2,4-Dinitrophenol	123	71	0.051	0.030	0.513	0.296	0.279	0.161	**0.843**	**0.487**
2,4-Dinitrotoluene	285	113	0.119	0.047	1.188	0.471	0.645	0.256	**1.953**	**0.774**
2,6-Dinitrotoluene	641	255	0.268	0.107	2.673	1.063	1.452	0.578	**4.393**	**1.747**
Ethylbenzene	108	32	0.045	0.013	0.450	0.133	0.245	0.072	**0.740**	**0.219**
Fluoranthene	68	25	0.028	0.010	0.284	0.104	0.154	0.057	**0.466**	**0.171**
Fluorene	59	22	0.025	0.009	0.246	0.092	0.134	0.050	**0.404**	**0.151**

Hexachlorobenzene	28	15	0.012	0.006	0.117	0.063	0.063	0.034	**0.192**	**0.103**
Hexachlorobutadiene	49	20	0.020	0.008	0.204	0.083	0.111	0.045	**0.336**	**0.137**
Hexachloroethane	54	21	0.023	0.009	0.225	0.088	0.122	0.048	**0.370**	**0.144**
Methyl Chloride	190	86	0.079	0.036	0.792	0.359	0.430	0.195	**1.302**	**0.589**
Methylene Chloride	89	40	0.037	0.017	0.371	0.167	0.202	0.091	**0.610**	**0.274**
Naphthalene	59	22	0.025	0.009	0.246	0.092	0.134	0.050	**0.404**	**0.151**
Nitrobenzene	68	27	0.028	0.011	0.284	0.113	0.154	0.061	**0.466**	**0.185**
2-Nitrophenol	69	41	0.029	0.017	0.288	0.171	0.156	0.093	**0.473**	**0.281**
4-Nitrophenol	124	72	0.052	0.030	0.517	0.300	0.281	0.163	**0.850**	**0.493**
Phenanthrene	59	22	0.025	0.009	0.246	0.092	0.134	0.050	**0.404**	**0.151**
Phenol	26	15	0.011	0.006	0.108	0.063	0.059	0.034	**0.178**	**0.103**
Pyrene	67	25	0.028	0.010	0.279	0.104	0.152	0.057	**0.459**	**0.171**
Tetrachloroethylene	56	22	0.023	0.009	0.234	0.092	0.127	0.050	**0.384**	**0.151**
Toluene	80	26	0.033	0.011	0.334	0.108	0.181	0.059	**0.548**	**0.178**
Total Chromium	2,770	1,110	1.158	0.464	11.551	4.629	6.274	2.514	**18.983**	**7.607**
Total Copper	3,380	1,450	1.413	0.606	14.095	6.046	7.655	3.284	**23.163**	**9.937**
Total Cyanide	1,200	420	0.502	0.176	5.004	1.751	2.718	0.951	**8.223**	**2.878**
Total Lead	690	320	0.288	0.134	2.877	1.334	1.563	0.725	**4.729**	**2.193**
Total Nickel	3,980	1,690	1.664	0.707	16.597	7.047	9.014	3.828	**27.275**	**11.581**
Total Zinc[2]	2,610	1,050	1.091	0.439	10.884	4.378	5.911	2.378	**17.886**	**7.196**
1,2,4-Trichlorobenzene	140	68	0.059	0.028	0.584	0.284	0.317	0.154	**0.959**	**0.466**
1,1,1-Trichloroethane	54	21	0.023	0.009	0.225	0.088	0.122	0.048	**0.370**	**0.144**
1,1,2-Trichloroethane	54	21	0.023	0.009	0.225	0.088	0.122	0.048	**0.370**	**0.144**
Trichloroethylene	54	21	0.023	0.009	0.225	0.088	0.122	0.048	**0.370**	**0.144**
Vinyl Chloride	268	104	0.112	0.043	1.118	0.434	0.607	0.236	**1.837**	**0.713**

LIMITS CALCULATIONS – Outfall 009

TECHNOLOGY BASED LIMITATIONS

Monthly Average = Σ Monthly Average Components

Daily Maximum = Σ Daily Maximum Components

Aquifer Water/Leachate Component:

Monthly Average = Σ(Average Flow **X** Average Factor)

Daily Maximum = Σ(Average Flow **X** Maximum Factor)

Where: Average Flow is in MGD
Average Factor is the average of the daily values for 30 consecutive days
Maximum Factor is the maximum for any one (1) day

Monthly Average = Design Flow x 8.345 x Secondary Treatment Monthly Average
Daily Maximum = Design Flow x 8.345 x Secondary Treatment Daily Maximum

40 CFR 414.61 – Commodity Organic Chemicals (BPT)			
Pollutant or Pollutant Property	**Average Flow(MGD)**	**Daily Maximum (lbs/day)**	**Monthly Average (lbs/day)**
BOD_5	1.512	1,009.41	378.53
Total Suspended Solids	1.512	1,880.03	580.41

Table 1 - 40 CFR 414.101 – No End-of-Pipe Biological Treatment (BAT)				
Effluent characteristics	**Aquifer Water/Leachate**		**Total (lbs/day))**	
	Daily Max	**Monthly Ave**	**Daily Max**	**Monthly Ave**
Acenaphthene	47	19	**0.593**	**0.240**
Acenaphthylene	47	19	**0.593**	**0.240**
Acrylonitrile	232	94	**2.927**	**1.186**

Anthracene	47	19	**0.593**	**0.240**
Benzene	134	57	**1.691**	**0.719**
Benzo(a)anthracene	47	19	**0.593**	**0.240**
3,4-Benzofluoranthene	48	20	**0.606**	**0.252**
Benzo(k)fluoranthene	47	19	**0.593**	**0.240**
Benzo(a)pyrene	48	20	**0.606**	**0.252**
Bis(2-ethylhexyl) phthalate	258	95	**3.255**	**1.199**
Carbon Tetrachloride	380	142	**4.795**	**1.792**
Chlorobenzene	380	142	**4.795**	**1.792**
Chloroethane	295	110	**3.722**	**1.388**
Chloroform	325	111	**4.101**	**1.401**
Chrysene	47	19	**0.593**	**0.240**
Di-n-butyl phthalate	43	20	**0.543**	**0.252**
1,2-Dichlorobenzene	794	196	**10.018**	**2.473**
1,3-Dichlorobenzene	380	142	**4.795**	**1.792**
1,4-Dichlorobenzene	380	142	**4.795**	**1.792**
1,1-Dichloroethane	59	22	**0.744**	**0.278**
1,2-Dichloroethane	574	180	**7.243**	**2.271**
1,1-Dichloroethylene	60	22	**0.757**	**0.278**
1,2-trans-Dichloroethylene	66	25	**0.833**	**0.315**
1,2-Dichloropropane	794	196	**10.018**	**2.473**
1,3-Dichloropropylene	794	196	**10.018**	**2.473**
Diethyl phthalate	113	46	**1.426**	**0.580**
2,4-Dimethylphenol	47	19	**0.593**	**0.240**
Dimethyl phthalate	47	19	**0.593**	**0.240**
4,6-Dinitro-o-cresol	277	78	**3.495**	**0.984**
2,4-Dinitrophenol	4,291	1,207	**54.142**	**15.229**
Ethylbenzene	380	142	**4.795**	**1.792**
Fluoranthene	54	22	**0.681**	**0.278**
Fluorene	47	19	**0.593**	**0.240**
Hexachlorobenzene	794	196	**10.018**	**2.473**

Hexachlorobutadiene	380	142	**4.795**	**1.792**
Hexachloroethane	794	196	**10.018**	**2.473**
Methyl Chloride	295	110	**3.722**	**1.388**
Methylene Chloride	170	36	**2.145**	**0.454**
Naphthalene	47	19	**0.593**	**0.240**
Nitrobenzene	6,402	2,237	**80.778**	**28.226**
2-Nitrophenol	231	65	**2.915**	**0.820**
4-Nitrophenol	576	162	**7.268**	**2.044**
Phenanthrene	47	19	**0.593**	**0.240**
Phenol	47	19	**0.593**	**0.240**
Pyrene	48	20	**0.606**	**0.252**
Tetrachloroethylene	164	52	**2.069**	**0.656**
Toluene	74	28	**0.934**	**0.353**
Total Chromium	2,770	1,110	**34.951**	**14.006**
Total Copper	3,380	1,450	**42.648**	**18.296**
Total Cyanide	1,200	420	**15.141**	**5.299**
Total Lead	690	320	**8.706**	**4.038**
Total Nickel	3,980	1,690	**50.218**	**21.324**
Total Zinc2	2,610	1,050	**32.932**	**13.249**
1,2,4-Trichlorobenzene	794	196	**10.018**	**2.473**
1,1,1-Trichloroethane	59	22	**0.744**	**0.278**
1,1,2-Trichloroethane	127	32	**1.602**	**0.404**
Trichloroethylene	69	26	**0.871**	**0.328**
Vinyl Chloride	172	97	**2.170**	**1.224**